Chapter 3

Arrival of Western Medicine: Colonial Reconstruction of Medical Knowledge

I Introduction

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I Introduction

Edgar J. Spratling, one of the most eminent physicians of the early twentieth century America, rread before the Medical Association of Georgia at its Fifty-third Annual Meeting, Savannah, April, 1902, "Brothers, there is where our power lies...the real arbiters of the great body politic of society. And think of the social power we even now wield...The people will demand this and the law will give it; we have only to stay awake and be aggressive... Could we ask for firmer standing ground or a longer lever with which to move the world?" (Sprtaling, 1902: 1688) The quoted remark perhaps epitomizes the authority prerogative and social power a professionalized medical practice exerts over society. But such was not the case even 300 years ago. Its journey unfolds a long and tortuous path before us. That is a separate account. At this moment we should be concerned with the way 'modern' or Western medicine came into interaction with other medical traditions across the globe and how it managed to wield its transformatory power over those medical practices. In this paper our focus is on Indian medical practices, particularly Āyurveda. Our primary concern is how exchanges between India and Europe occurred and at what levels, while talking about medical encounters. In a meaningful way these two accounts reveal to us the trajectory modern medicine has traversed through last four centuries. It would also help us to understand complex interactions and various levels of exchanges that took place between indigenous and modern medical knowledge during colonial encounters. This dissertation has consistently tried to focus on the role of anatomical knowledge in the reconstruction of epistemological categories of Ayurvedic *śarīra*. However, it has been recently argued, "the search for cultural legitimacy that

characterized Indian science in the nineteenth and early twentieth centuries was displaced by an increasingly dominant discourse of scientific industrialism." (Harrison, 2005: 60) In a recent article Shruti Kapila contends that the cultural construction of science holds a mirror up to the political rationality of difference and the complexities of the idea of difference refer as much to political considerations as they refer to the cultural artifices of science. (Kapila, 2005)

Although the body has become the object of much academic work in recent decades, colonial encounters and exchange in knowledge of the body are less theorized. By examining the forms of exchange/encounter between western medical knowledge of the body and their Indian (specifically Ayurvedic) counterparts, this discursive silence may be remedied. We can rather think of the technologies of the body which, methodologically speaking, should adopt neither 'diffusionist' nor 'disseminationist' nor 'indigenist' models. To an extent, all these models speak of a triumphalist narrative, the victory march of Western civilization, or the reverse. Contrarily, medical encounters between the two different world views were informed by a dialogue between cultures rather than only imposed by the British or hailed by the 'colonized.'

The body has come to be recognized as a terrain on which struggles over control and resistance are fought out in contemporary societies. (Hancock, 2000) Kenneth M. Boyd asks, "Why do attacks of viruses count as illness, but not the attacks of larger animals or of motor vehicles? Is it just a question of size? Or of invisibility? ...Does a disease have to be something *in* me? And in what sense of 'in'?" (Boyd, 2000: 11) To reconcile opposing concepts and confusion, may be to lesser extent, the concept of disease becomes normative – where, what counts as the 'norm' is prescribed rather than statistically derived. In effect, we decide what constitutes a disease. What do we mean when we use the word 'disease' and when we use the word 'health'? Sometimes the debate seems to be merely about our use of words. Sometimes little consideration is given to the underlying biology. 'Facts' are always processed—interpreted, placed into some overarching context—whether a scientific theory or an ill person. Inextricable from context, facts must assume their meaning from a universe of other valued facts. In a sense, value is the glue that holds our world together, for knowledge is inexorably valued; it is both useless and irrelevant divorced from the reality of the personal domain. This

does not mean that knowledge is necessarily subjective, contingent, or arbitrary. Contemporary medicine prides itself on scientific accomplishment and the objective status of disease. Indeed, the distinction of scientific 'facts' and corrupting subjective 'values' represents a crucial distinction in the development of modern science. This attitude was formally introduced in the 19th century as positivism, the philosophy that purportedly separated objective pursuits from those that were neither objective nor neutral. However, the positivists' position originated earlier, with David Hume's famous proclamation that one cannot infer an 'ought' from an 'is': that a moral case cannot be deduced from a natural fact. (Tauber, 2005) Arthur Kleinman, the noted psychiatrist-anthropologist, offers an example from a report of Ralph Blumenthal's "Cries to Halt Publication of Holocaust Book" in the *New York Times* of Tuesday, March 10 1998, to show "the immense disjunction between the claims for what is supposedly known about the biological bases of human nature and what is actually known about human conditions." He concludes, "Viewed from the decidedly ordinary practices of everyday experience, human conditions certainly have a biology, but they have a history, a politics, an economics, and they reflect cultural and subjective differences." (Kleinman, 1998) Now the question of human experience comes up. It is true, no doubt, that there is a lot of confusion about the notion of experience. Following Bacon, experience may be of two types – be it 'ordinary experience' or 'ordered experience'. Unlike the multinational origins of empirical evaluation of surgical therapy, the introduction of an empirical approach to the evaluation of medical treatments was a largely British initiative and the principal actors were medical graduates of Edinburgh University. One of them was James Lind (1716–94). He was implementing Bacon's concept of 'ordered experience' in his clinical trial. (Tröhler, 2001) From the positivist orientation, the independence of the known 'fact' rests on its correspondence to a reality that any objective observer might know. This assumes both a universal perspective, a 'view from nowhere,' *and* a correspondence theory of reality. (Tauber, 2005) Such a mode of understanding and conceptualization was very much palpable in Indian context. India had to envisage an altogether different ('other') cognitive and philosophical import.

There was descriptive anatomical knowledge in traditional medicine enshrouded by philosophical and religious orthodoxies and interventions which made it 'holy' and

'eternal.' But Western medical knowledge provided the knowledge of dissection and revealing the interiors of the body. The body was subjected to experimental verification. Rasmussen identifies one source in the concession of established Christian orthodoxy to permit dissection of the human body some five centuries ago. (Rasmussen, 1975) Such a concession was in keeping with the Christian view of the body as a weak and imperfect vessel for the transfer of the soul from this world to the next. For in the eyes of the Church these had more to do with religion and the soul and hence properly remained its domain. This compact may be considered largely responsible for the anatomical and structural base upon which scientific Western medicine eventually was to be built. For at the same time, the basic principle of the science of the day, as enunciated by Galileo, Newton, and Descartes, was analytical, meaning that entities to be investigated be resolved into isolable causal chains or units, from which it was assumed that the whole could be understood, both materially and conceptually, by reconstituting the parts. With mind-body dualism firmly established under the imprimatur of the Church, classical science readily fostered the notion of the body as a machine, of disease as the consequence of breakdown of the machine, and of the doctor's task as repair of the machine. Thus, the scientific approach to disease began by focusing in a fractional-analytic way on biological (somatic) processes. (Engel, 1977)

In this paper, there remains a modest attempt to specifically focus on: (1) the shaping of transformatory perceptions about the three-dimensional body against the two-dimensional body-frame in Āyurvedic education, (2) localization of *space* (in the form of anatomical pathology against ayurvedic humoral pathology) and *time* (both in the form of anatomical physiology against humoral physiology and the production of *clinical charts* in hospitalized patients), and (3) creation of medical professional authority outreaching people through teaching institutions, dispensaries, hospitals, cantonments, asylums, and jails and also through private practice. Medicine was one of the ways in which imperialism sought to 'know' the people and establish its authority over them – thorough vast quantities of information about diseases and health that began to be amassed in statistical and scientific form and through development of medical agencies, themselves often branches of the state structure itself, that began to reach out into the countryside as well as towns. (Arnold, 1988: 17) Through 'knowing' the people and establishing its

authority, colonial medicine did create a new kind of subjectivity that was altogether different from that of Āyurvedic viewpoint. "Whereas in the pre-colonial past health and medical care were matters for individual initiative or at most communal effort, under imperial rule they became part of a wider process of state regulation and centralized control." (Arnold, 1988: 18)

In the early years of 'Colonizing the Indian Body', it would cost 100 pounds to train a soldier. Hence, this loss had to be averted. (Moore, 1862: 6) Colonel Hodgson warned, "in Bengal one year encounters as much risk of life as in three such battles in Waterloo." (Moore, 1862: 13) During the first sixty years of the present century the mortality among European soldiers in India averaged 69 per 1,000 annually, while invaliding, during at least the latter part of the period referred to, averaged 29 per 1,000. Surgeon (now Deputy Surgeon-General) Chevers, comparing other death-rates as given by Dr. Guy, found that while European soldiers in India died at the rate of 69 per 1,000, the mortality among the metropolitan police was only 7 per mille. A year passed away, and 125 recruits were required to fill the broken column. Eight years passed away, and not a man of the original thousand remained in that dissolving corps. (Moore, 1886: 1-2) The army and navy and the East India Company required large numbers of medical officers. These services offered situations and advancement for large numbers of young men, and not only during the French wars. The army employed just 142 surgeons in 1793 but over 950 by 1815. Indian situations increased as the Company's domains grew. In 1793 the Bengal presidency directory listed 155 surgeons. By 1837, it included 379. (Stanley, 2003: 24) The mortality of Indian service ensured that each year the Company's directors sought replacements, and the Company's 'Cadet papers' demonstrate there was no shortage of applicants. The cholera epidemics of the 1830s prompted a requirement that all British vessels carrying more than fifty passengers should have a qualified surgeon aboard. 'The cholera has done this good for young surgeons' the *London Medical and Surgical Journal* remarked. (Stanley, 2003: 24) To Regency and early-Victorian Britain, the term 'surgeon' covered a great diversity of character, commitment and competence. It included the operative surgeons in the great metropolitan hospitals and civil medical officers in Indian cantonments, regimental surgeons and men who were becoming known as general practitioners. (Stanley, 2003: 29) In addition, to remember,

"The mortality was so great that the population, the productivity of the land, and consequently the government revenue were greatly diminishes." (Gibson, 1983: 203)

It was mandatory for the British to introduce modern medical education in Bengal (and India). During the nineteenth century Western medicine enjoyed an intimate association with colonial power. "Its first priority was the protection of the European community and those interests and individuals closely connected with it" (Arnold, 1985: 179) At the same time, the existence of established medical systems and folk practice constituted a major barrier to the penetration of Western medicine before 1900. Colonial medical practice in India benefited European medical personnel in two ways – (a) "Our professional brethren in India *have the opportunity of observing* effects of climate on the human system, over an extensive and greatly varied portion of the surface of the earth, on distinct races of man, dissimilar in their food, habits and regimen." (*Edinburgh Medical and Surgical Journal*, 1826: 396), and (b) "Though many medical men obtain very considerable eminence in their character as physician in Calcutta and other presidencies, and no small member turn *their experience* which they have acquired in India, *to good account at home...*" (*Parbury's Oriental Herald and Colonial Intelligencer*, 1838: 251-252)

Here are two relevant issues. First, the seventeenth century saw the birth of three very important things, namely – scientific chemistry, the microscope, and the idea that disease might produce specific changes in the blood which could be detected and would be helpful in the management of the patient. The lesion spoke through the patient, though it only finally yielded its secret in the physical examination. In other words, clinical pathology and pathological anatomy began to make long strides. (Foster, 1959) Second, with the introduction of the use of stethoscope by Laennec in 1816 this science turned out to be that of physical diagnosis, and led directly to the organ-pathology and Linnaean identification of 'disease', the two developments that became major contributions of the nineteenth century to Medicine. (Newman. 1960) Aided and informed by these technological advancements and an altogether different system of knowledge Europeans came to conquer geographical territories as well as knowledge world of India. It was in its validation of the colonial civilizing mission and 'difference' that colonial medicine informed attitudes and responses within indigenous society. It may be emphasized here

that the word *science* is adopted by Āyurvedic doctors (as by many other kinds of doctors) as a sign for a universal knowledge that transcends national and cultural boundaries. For most Āyurvedic doctors today the question seems to be not whether Āyurveda is a science (indeed, the root *veda* is routinely translated as science) but rather how it might differ from other sciences. (Langford, 1995: 334) With this objective, it may be pertinent to know, (a) how, with the introduction of anatomical knowledge in India, a new history of 'medicalization' and surveillance of population was written for ever, and (b) how different levels of interactions are noted and certainly shaped by an encounter with modernity that takes place on various fronts, from the purely medical to the socio-moral.

At this juncture, we can cite two differing accounts (more than two centuries later than that of Fryer) of a Bengali peasant and of elite. These accounts reveal multi-layered perception of the body, being and conceptual framework in colonial India. A peasant of Birbhum (of Bengal) writes to a person (to whom he owed some amount of money), "I went to town wreaking evils against you, so I am contacted with an alien disease. You should know it ... and on getting cured I must repay the whole of debt whatever I owe to you." (Mandal, 1953) On account of the complex referentiality of somaticity in India, the body provides a kind of skeletal structure for an alternative history of disease understanding and the specific site for identity formation (particularly during nationalist period) against colonial backdrop.(Alter, 2000) An opposite contemporaneous 'elite' account is provided by Dwijendranath Tagore, "Treatment by any means is a wild goose chase! So better not to say anything about *kaviraji chikitsa* (Āyurvedic treatment) – even the shimmering rays of nineteenth century knowledge has failed to penetrate its windows." He continues, "Modern medicine starts with *dissecting* a cadaver. Āyurveda starts with elaborating on relationship between the body and mind." Inspired by "modernity" he uses innovatively the categories of Āyurveda like *vayu, pitta, shlesma* (wind, bile, and phlegm), to interpret the superiority of Western intellect. In his opinion, persons like Danton belong to the category of *pitta* or bile and represent "social dynamics." Finally, he concludes, "By the raging light and scorching heat of English education orthodoxies began increasingly to be banished from metropolis to the fringe of villages." (Tagore, 1891) It is understandable that while in the first account the role of

karma comes first for disease causation[1], in the second, *dissection* (or anatomical spatial localization of organs) constitutes the core of argument. Another interesting point may be noted. Technical terms (*pitta, shlesma* etc.) used in Āyurveda were extensively used in every-day life too with different connotations. "The primitive meaning which can be restored does not indicate quite surely the derivative meanings in which the words have been used in the texts." (Filliozat, 1964: 144)

Importantly, the vision of the sick-man institutionalized within the tenets of Bedside medicine was that of conscious human totality – a viewpoint that transcended, not merely united, the distinctions of psyche and soma found in modern medicine. (Jewson, 1976) Put against Rasmussen's analysis some interesting facts can be elucidated here. On 24 March 1603, after nearly half a century on the throne, the mortal form of Elizabeth I ambiguously returned to being solely a body natural. Her remains were attended as assiduously as she had been in life. "No longer sovereign, she reverts to being a woman whose wishes can be ignored. Her body natural is unimportant in the transfer of power to the next monarch, it is the effigy that counts." (Cregan, 2007) Again, "This unwarranted breaching of her body was performed by a fledgling group of 'scientists' whose work enjoyed the royal imprimatur." (Cregan, 2007: 51) Anatomical dissection was not conceived of as an extension of retributive justice in England until the 18th century, nor was that conception put into law until the 'Murder Act'. Fate of the felons was more tragic. They were carried back to the Hall under a pall kept for the purpose, for ceremony's and modesty's sake. Once at the Hall they were placed on a table, still beneath the pall and at one stage behind a screening curtain, to wait in readiness for the lectures. At this period all public anatomies were held in the main Hall, with the table centrally located, surrounded by scaffold seating that was set up specifically for the occasion by a carpenter. When the Reader, Masters, Apprentices, Stewards, etc. had assembled, the body would be uncovered. Six anatomical lectures were given over three days, with a morning and afternoon lecture on each day. Each day was spent on a separate system, and in a strict order that took into account the natural processes the body was undergoing in an age when neither embalming nor cool storage were effective:

[1] Kutumbiah understands *karma* as "movement". It is "action" for Wujastyk and Debiprasad Chattopadhyaya, while Julius Jolly understands it as a question of rebirth.

visceral, muscular, and osteological. (Cregan, 2007: 53-54) It was that period when social milieu was reconstituted with heavily charged philosophy of positivism and utilitarianism. (Forbes, 1999; Stokes, 1959) To my opinion, whatever brief or sketchy it may be, it is useful to understand the development of anatomical knowledge, medical education and hospital system in England to have a better understanding of the role of anatomical knowledge in colonial medical education. I shall discuss this issue in some greater details later in my paper.

II Characteristics of Western Medicine till the Beginning of the 19th Century

Western medicine has passed through epistemological and paradigmatic shifts as discussed above. But till the end of the 18th century or the beginning of the 19th century, it, in its theoretical content, was essentially guided by ancient humoral theory, which was not seemingly much different in its core from Indian medicine. But how was Western medicine both *epistemologically* and *ontologically* before the fully evolved structure as we experience now? Even legendary physicians like Boerhaave (1668-1738) or Sydenham (1624-1689) stressed on taking patient's history as the most important thing to learn. There is a very remarkable passage in Sydenham's *Treatise of the Dropsy* going through which one will find that "he asserts not only his own strong conviction of the importance of a knowledge of minute anatomy to the practitioner, but also his opinion that what Hippocrates meant, was to caution against depending too much on, and expecting too much help from anatomical researches..." (Brown, 1866: 83-84) In Sydenham's own words, "in all diseases, acute and chronic, it must be owned there is an inscrutable (i.e. Greek word), a specific property which eludes the keenest anatomy." (Brown, 1866: 84) Herman Boerhaave, another great 17th -18th century physician, taught his students, "Everything pertaining to the case must be listed... Narration must be done carefully so that the order of events be unchanged; there must be arrangement according to the surging change of events, and each event must be recorded in its proper place." (Derbes and Mitchell, 1955) We find both the medical stalwarts, Sydenham and Boerhaave, were more interested in patient's history than on pathological findings.

Moreover, the medical world of the early nineteenth century was, in the words of a contemporary, 'mixed, jumbled, brayded and blended'. "Compared with Paris London

boasted more than twice as many qualified medical men per head, all rivals in an open and fiercely competitive market. In addition to the 'regular' practitioners were 'the irregular troops of corn-doctors, horse-doctors, tooth-doctors and quack-doctors'." (Stanley, 2003: 23) From the 1790s, hospitals became finishing schools for medical apprentices. Aspiring doctors acquired both knowledge and skills by studying in one of the medical schools of the capitals in London, Edinburgh or Dublin, at Glasgow or the ten English provincial schools established between 1824 and 1834. In 1786 130 students were studying in Edinburgh. By 1806 the number had risen to 366 and in 1826 to 574. London hosted 800 students in the 1820s and by the 1840s perhaps 1,500 enrolled in the capital's hospitals and private schools at any time. (Stanley, 2003: 161) In the eighteenth century, there were very few essential educational prerequisites to medical practice. Medical students could devise and select their own curriculum, according to what their financial resources would allow and what form of medical career they wished subsequently to pursue. "The market for medical services in the eighteenth century being an open and pluralistic one, the successful practitioner was by necessity an entrepreneur... London was good place to which to come to learn anatomy." (Wrigley and Revill, 2000: 90, 92) Hospital appointments were almost entirely honorary. Guy's paid its surgeons and physicians £40 a year. On the contrary, private medical and surgical business was quite lucrative. "The rewards of success could be considerable. The surviving receipt books of Benjamin Brodie, for example, show that he made over £8,000 a year in the late 1820s while Sir Astley Cooper, the surgeon to the King and popular among his colleagues, was believed at the time to have made over £15,000 a year from private practice." (Stanley, 2003: 25)

Sir Cooper strongly advocated for (1) the requirement for surgeons to improve their knowledge of anatomy, and (2) the need for the medical profession to close ranks against the activities of unqualified practitioners. Doubtless it led to the stream of professionalization of medicine. Sir Astley's emphasis on the importance of anatomical knowledge was actively supported by no other than Wakley, the famous editor of the *Lancet*, who wrote in the February 8 issue of 1924 – "Without anatomy medicine and surgery cannot be acquired; and by these sciences, some of the greatest evils which afflict human life can alone be relieved." (Kandela, 1998)

By the late eighteenth century, London had become not only a center for surgery, anatomy, firsthand dissection, and hospital experience, but also a training ground in medicine, chemistry and midwifery. "The evidence suggests that many London students pursued an education suitable for general practice without regard to the ostensible professional divisions embodied in the traditional London medical corporations." (Lawrence, 1988: 172)

But, unlike India, there were some indelible changes – (1) rise of institutional medical education and practice, particularly hospital setting, (2) mandatory acquisition of anatomical knowledge through cadaver dissection, (3) rise of medical professional authority, (4) hierarchical division between physicians, surgeons and apothecaries, (5) study of post-enlightenment scientific logic and reasoning to produce both "capable enquirers" and "capable practitioners" in a pluralistic, free market of industrial society, (6) mapping of the body from a mechanistic viewpoint plotted against three-dimensional anatomical space, or the volume of the body, and linear, scientific, clock-time consistent with physiological swings, and, finally, (7) an altogether different paradigm of patient-physician relationship – patient-physician-service – against the background of clinical detachment. Anatomical and tissue pathology played a central role in this transformation. (Dyer and Thorndike, 2000) The singular act of post-mortem dissection and its marvelous use in organ localization of disease and successful surgical procedures differentiated Hospital medicine from Bedside medicine as well as established its unquestionable authority over Indian medical knowledge system. Pathological anatomy was only rarely applied to bedside medicine, since it was impossible to detect the organic changes in a cadaver before the patient died. Specific organic lesions had been described for at least a century, but, for several reasons, practicing physicians were unfamiliar with anatomical changes. "With auscultation, it became possible to detect internal changes in the living patient." (Duffin, 1999: 252) However, Laennec's 'doctrine' stated that the body has three components: solid (organs), liquids, and vital principle. Each can be altered to produce disease. Lesions are of two types – solid lesion and liquid lesion. Here again, though Laennec talks about pathological anatomy the notion of *vital principle* is retained. (Duffin, 1999: 263) When British came to India, all these sea changes were occurring within their world of medical knowledge. There was a mutual refraction of colonial and

metropolitan medical theory. British people's conceptions of their own biomedical identity were reformulated within a global context, as part of their own response to the experience of colonial disease. Moreover, "The British experience of disease raised questions about where colonial contact begins and ends as the imperial metropole with its heterogeneous, impoverished, and anonymous populations seemed more and more to be simulacrum of the periphery." (Bewell, 1999: 12-13)

Two issues are intertwined here: (a) the evolution of Western (in our case British) medicine from its old quarters of humoral theory to the stage of Hospital Medicine, and (b) various phases of contact, interaction, assimilation and encounter between this system and traditional Indian healing systems (in our case Āyurveda). "The practice of medicine in early modern England was dominated by the humoral theory, originating in ancient Greece." (Lane, 2001: 2)

We may now proceed to elucidate the points raised in this section. Charles Newman argues, "To make a very broad generalization, the practice of medicine since the Renaissance has fallen into three phases. In the first, diagnosis was made by the elucidation of symptoms, and treatment was based on *a priori* theory (applied with heroic vigour). This phase lasted from the end of the fifteenth century to the beginning of the nineteenth century. In the second phase, diagnosis was based on physical examination of the patient, and treatment was aimed at structural abnormalities; this lasted for the rest of the nineteenth century, and has been succeeded by the third phase, which is still being developed, in which diagnosis is based largely on laboratory..." (Newman, 1958) During this process, medicine and normativity appeared to be fundamentally linked. "To conjure up the image of the doctor is simultaneously to visualize the sickbed on which the ill body is *isolated*, the case notes that individualize the progress of the condition in relation to medical *norms*, the charts and records..." (Rose, 1999: 53) We should take note of 'isolated' or 'individual' patient and his relation to 'norms'. It should also be emphasized that prior to the development of such rather regimented and surveillance-oriented (bio)medicine it had to pass through stages of fluidity, non-uniformity of medical education – sometimes bordering on seemingly directionless-ness. It was most poignantly marked during the 17th and 18th centuries, often extending onto the 19th century. Organ localization of disease was not the call of the day even during the late 18th century, at

least in Britain. For example, physiology at Bichat's time did not yet exclude the observation of social factors and influences. "He regards the superiority of the right side as a social convention." (Ackerknecht, 1967: 54) However, he raised question, "What is the value of observation if one does not know the seat of the disease?" (Ackerknecht, 1967: 56) More than 150 years after the discovery of circulation in 1616 by William Harvey in 1759, Richard Davies, a Cambridge scientist, wrote to Stephen Hale "the discovery of the circulation has not been followed by so great advancement in the science of medicine as was naturally to be expected from it. The reason of which is, that our theory has not yet advanced much in the knowledge which is naturally founded upon this grand principle." (Robb-Smith, 1962: 6) Moreover, the 18th. and the 19th-century therapeutics were heavily charged with old knowledge of treatment based on humoral theory. Disease was due to a localized irritation of some viscous and should be treated by a powerful anti-phlogistic or weakening regime, which consisted of starvation and bloodletting. This arbitrary doctrine was replaced gradually by "the statistical arguments of Louis, the sarcasms of Laennec" (Robb-Smith, 1962: 15), and, to add Hunter's contribution to anatomical pathology. (Lakhani, 1991) It is found that a 17th century physician of no less stature than Sydenham suggested that attempts to discover the causes of disease were doomed to fail. Another example may be had from Sir Richard Blackmore, a pupil of Sydenham's. He was advised by Sydenham to read *Don Quixote* if he wished to become a good doctor. This is a fact "which does not exactly betoken great confidence in the achievements of medicine as they then were." (Fischer-Homberger, 1970)

There were some problems with the status of a surgeon too. "To Regency and early-Victorian Britain, the term 'surgeon' covered a great diversity of character, commitment and competence. It included the operative surgeons in the great metropolitan hospitals and civil medical officers in Indian cantonments, regimental surgeons and men who were also becoming known as general practitioners." (Stanley, 2003: 29) It included men who practiced dissection daily, who rehearsed operations on 'the dead subject' and who operated once a week or more and also those who drew no more blood than that spilt using a lancet and avoided operating at all costs. It encompassed men who practiced at the highest level of professional knowledge and those barely removed from quacks.

Despite the names 'surgeon' or 'surgeon apothecary' the great majority of men graduating from these various institutions were destined to practice medicine in general rather than surgery in particular. Men nominally 'surgeons' could practice for years without cutting more than a boil or a vein. In addition, "Baglivi, Belini, Bernouli, Michelotti, and Boerhaave hit on a number of discoveries by applying the principle of mathematics to medicine, and the anatomists uncovered many of nature's secrets, however, all these findings were of no practical use." (Fischer-Homberger, 1970: 399) To be brief, nosology was of primary interest to the leading physicians and medical scientists belonging to the world of those centuries. Delving into the depth and volume of the bodies was not much alluring to them. Bichat's "Open up a few corpses" was not a cup of tea. This scenario can be substantiated by a tragic fact. Though Laennec's discovery of stethoscope and mediate auscultation verified by post-mortem studies were published in 1819, the reputed attending physician of the poet John Keats Dr Clarke did not apply this method to the diagnosis of Keats's pulmonary tuberculosis (or phthisis) complicated by copious haemoptysis. In her famous biography of Keats the author ruefully comments, "Everything that ignorance could blunder into, every mistake of practice which could be made were done and made with the best possible intentions by Dr. Clark. He meant well, but the tale is heart-rending. A perfectly just summing up of him is, I think, that he was a poor doctor, with a kindly heart and a pleasant *bedside manner*." (Jarcho, 1961. Emphasis added.) Despite this, "The image of the physician as a demi-god possessed of boundless authority over patients dates from the late nineteenth century. Female patients, for example, became willing to submit to pelvic examinations and to give birth in the lithotomy position because they had acquired an implicit belief in the doctor as scientist." (Shorter, 1993: 790)

Jewson states the characteristics of this period under consideration in a more explicit way, "In the period under consideration medicine was regarded as an area of intellectual enquiry in its own right. The 17th century scientific revolution had little impact on the fundamental characteristics of theory and therapy... The very definition of illness was couched in terms of the patient's complaint, rather than internal lesions or cellular malfunctions... Medical consisted of a *chaotic diversity* of schools and thoughts, each strenuously seeking to attain ascendancy over the others." (Jewson, 1974: 370-371)

More importantly, "despite criticism of specific aspects of the ancient texts and the appeal to new sources of legitimation, the classical authors remained the standard works read by medical students at the English universities." (Jewson, 1974: 372) Only new addition to this system of knowledge was the crude accommodation of Newtonianism. Interestingly enough, we shall find almost similar phenomenon in Indian context too. The eighteenth century saw a bewildering proliferation of medical texts and theories that seems indeed to have been a distinctive feature. Intense as the debates between medical theorists were, it did not make much practical difference to the understanding of disease at the bedside whether the morbid matter was conceived of as particulate or humoral. Many theorists combined both forms of explanation. (Nicolson, 1988) It can be easily conceptualized while comparing the eighteenth-century term "metastasis" with its present day connotation – "As well as being expelled to the outside, morbid material could be transferred from site to site within the body, thus altering the locus of disease. This was what eighteenth-century writers referred to as metastasis...To the eighteenth-century physician, restitution of health was a temporal process, modulated by the changing conditions of the internal organs-changes which only he had sufficient skill to discern." (Nicolson, 1988: 281, 292) It will be more revealing when we compare the two systems of education sans private fee, prominent institutional role and more secular nature of the British education. One example can be cited here. As late as 1777, in surgical lectures of Munro Primus, we find the elaboration of the teaching material in this way –

Medicine is commonly divided into five parts:

Ist or an extract Knowledge of ye humane Bodys.

2d or history of Diseases.

3d or Signs of Disseases.

4th or Means of preserving Health.

These must be understood and acquainted with before we can pretend to venture on the 5th or ye Method of Curing and healing Disseases which is performed by ordering a right Diet; by Pharmacy or prescription of Medicines; and by Surgery or Manuall Operations: this last is ye province that falls to my Share, which would appear to be of as long Standing if not more Antient then any part of Medecine for wee see by ye Antidiluvian History that very soon after the

Creation Fends, Animosities & Envies possessed the hearts of Men hence Rapines Murders and petty Wars Ensued by which the Parties might have been expos'd to externall Injuries, for which Nature prompts people to seek and apply a Remedy, that is Surgery tho' perhaps very unperfect must then have been in Exercise whilst otherwise the Inhabitants of ye Earth lived so temperately in such a moderate Climate and Serene Air that they arrived to these prodigious Ages of which ye Scripture gives an Account. Some of them lived to [blank] Without being obnoxious to those Disseases which this Day so effect Mankind. (Wright-St. Clair, 1961)

It is interesting to note that Āyurveda is often called *Aṣṭānga Āyurveda* because it has eight branches or divisions. These facts will be dealt with in the later part of this essay. In the above-mentioned lecture Munro Primus talks about the qualities of a new surgeon:

I shall think it necessary for Surgeons to be acquainted with them (i.e. Internal Medicine) in several Cases.

This particular Science is divided into four branches.

1st *Synthesis* or Joining or reuniting parts yt are contrary to ye Design of Nature seperated, as in Curing of Wounds, reducing Luxations, Setting of fractures.

2d *Diaresis* Dividing or seperating those parts yt by their Union are hurtfull as in perforating ye Anus or Vulva of Children, seperating of Members grown together after burning.

3d *Exe resis* Or taking away what is Superfluous or Noxious as in Amputating a Sphacelated Member, Extracting Bullets lodged within ye Body, Letting out extravasated blood, Matter or Pus.

4th *Prosthesis*; or making up any Want or Supplying a defect; as fitting wooden Leggs to Stumps, setting in Artificial Eyes or Teeth.

He goes on – "A regular Surgeon thus qualified who would practise right Ought before he goes about the Cure to be thoroughly acquainted with ye History of the Dissease, in which he is to have regard to the Patients Sex, to his Age, to his Constitution and former way of living; and Inform himself how ye Dissease encreased, if there was any known Cause for it, then to Consider ye Nature of it, and place it is in, and ye effects

it has produced, which knowledge is called ye Diagnosis whence ye Prognosis or what ye Consequence will be must be drawn and then see what Method of Cure is pointed out which is termed ye Indication. . ." (Wright-St. Clair, 1961: 289)

When one reads this passage it sounds very similar with a part of *Suśruta Samhitā* – "Young persons, who wish to take up the noble profession of healing the sick, should be of good social status, physically robust and healthy, mentally energetic, eager to learn, patient and painstaking, pleasant in speech and manners... The subject of study should not be limited to Āyurveda alone, but should include as much as possible all other branches of science and philosophy... Before commencing actual practice, the intending physician has to obtain a proper licence or permission from the royal court... He should remember that patients trust their physicians implicitly to the extent of placing their lives unhesitatingly under their care." (Ray, Gupta and Roy, 1993: 107)

Coming back to the period of Bedside medicine, one of the important characteristics of the 18th century medical education can be traced thus, "The emphasis on constructing a theory of surgical diseases, especially on creating new physiologies to account for morbid changes, such as inflammation, well known in John Hunter's work, made surgery respectable by giving it an abstract foundation. In the process, the senses could not be given the free rein associated with empiricism, but had to be disciplined and ordered by a rational system." (Lawrence, 1993: 163) Moreover, "Competing theoretical systems, attention to the patient's account and the lack of physical examination... for the practitioner - in theory - had little social or intellectual authority to violate the patient's physical privacy and much to gain by providing acceptable explanations of illness and therapeutic regimens... surgeons, in contrast, were much more closely tied to the 'objective' experience obviously offered by a deep knowledge of anatomy and the need to touch their patients to identify conditions and to operate. For surgeons, what the patient said would supposedly be of less importance than what the practitioner saw or felt." (Lawrence, 1993: 155-156) In this social milieu, medical practitioners did not comprise a homogeneous occupational group but were divided into several, often warring, factions. The costs for a physician's training were high. Professional education at Oxford and Cambridge consisted of a six years' course in a wide range of subjects, followed by a slightly longer period of devoted to a literary study of the classical medical authors. The

surgeon and apothecary had a lower status and income than the physician. (Jewson, 1974: 374)

The eighteenth century physician was expected to be, above all else, a gentleman, socially accepted in the circles among which his patrons moved. Elegance and wit were of greater importance than technical competence. Waddington comments, "It is clear that such a situation was inimical to basic research and innovation in medicine." (Waddington, 1973) Moreover, "Perhaps one of the most *important* methodological changes characteristic of early nineteenth century medicine was the shift from *observation* to *examination*." (Waddington, 1973: 214) The Victorian era was an age of imperialistic expansion for Great Britain. Not a single year passed between 1837 and 1901 without British troops and traders being engaged in combat somewhere. "The influence of exotic climates on British clinical science was to continue in the nineteenth century when Manson, a graduate of Aberdeen University, working in China and also interested in sprue, showed that filariasis was transmitted by a mosquito, an observation greeted with incredulity when published in the *Transactions of the Linnaean Society* in 1879, and in 1897 Ronald Ross discovered the malarial parasite in the stomach of an anopheles mosquito." (Booth, 1979: 1472)

Until the nineteenth century, the training of practitioners in hospitals varied greatly from one institution to another and was essentially controlled by the senior men in the hospital as to syllabus, length of courses, fees and practical experience. "The provision of medical attention since the early modern period in England had always been a business, with fees paid for services rendered. However, in the consumerist eighteenth century, medicine expanded fastest of all the superior occupations to become...Medicine became with larger apprenticeship premiums, better incomes and higher social status for practitioners, an occupation which gentry or ambitious parents could choose as a career for their sons." (Lane, 2001: 11) Despite these characteristics (and lacunae with regard to present day medicine), an important step in the professionalization of medicine was the publication of medical registers from 1779, enabling patients to choose practitioners and to contact each other. In 1783 there were 3120 practitioners. Of these 363 were physicians (11.6%), 2614 were surgeon apothecaries (83.6%), with 79 apothecaries (2.5%) and 64 surgeons (2.05%). (Lane, 2001: 15) Until the nineteenth century, the

training of practitioners in hospitals in England varied greatly from one institution to another. The term 'practical anatomy', clearly implying dissection, was not noted as a feature of anatomy courses in the London hospitals until 1802. It was also noted by a foreign visitor in 1791, "The aversion of the English to anatomical dissection is another of the prejudice which characterize that nation." (Lane, 2001: 26) There would remain little wonder that the British, with this experience in their homeland, must be cautious, yet avid to introduce anatomical dissection in India as early as they could do.

Following our discussion so far we can take note of some important facts –

(1) Till the beginning of the nineteenth century medicine or Bedside medicine was principally guided by the humoral theory of ancient Greek origin. Gaining anatomical knowledge through dissection was running parallel to it and, as a positive impact, fortified this endeavor. "For the first time students were exhorted to understand the structure and function of the body by detailed dissection. Dissection of cadavers became a mania. In 1801 Hampton Weekes, a student, told his father (an apothecary) that St Thomas's apothecary had given him a foetus ('very perfectly formed about 4 Inches long'). Anatomy to these men meant 'surgical anatomy': the knowledge they needed in order to operate. Many surgical students became demonstrators in anatomy in hospitals or private medical schools before becoming operating surgeons, and medical journals and medical societies ceaselessly disseminated and published the results of the anatomical spirit animating the profession." (Stanley, 2003: 50-51)

(2) There was a chaotic educational environment with respect to the training of a physician or a surgeon.

(3) Along with this there was development of scientific inquiries and newer practical innovations like Hunter's successful surgical treatment for popliteal aneurysm. "He closed the loop of the scientific method: hypothesis, experiment, clinical application and evaluation of results. This was translational research in another era." (Moore, 2005) A late-seventeenth century physician Archibald Pitcraine succinctly puts it, "I do advise indeed all diligently to consider the Principles of the Cartesian Philosophy, and to compare them with those of *Democritus*, so far as Geometry will conduct them... as Quantification for the Study of medicine, I rather recommend an Acquaintance with the *Mathematicks*, than with the *Philosophy* which so much *now in esteem.*" (Guerrini, 1987)

(4) "By the late eighteenth century, London had become not only a center for surgery, anatomy, firsthand dissection, and hospital experience, but also a training ground in medicine, chemistry, and midwifery. The evidence suggests that many London students pursued an education suitable for general practice without regard to the ostensible professional divisions embodied in the traditional London medical corporations." (Lawrence, 1988) Between 1780 and 1820, students primarily sought training on the surgical wards of a large London hospital. The hospital ward-walking pupils formed a ready audience for lecture courses that supplemented their experience and personal study. The number of courses advertised in the basic subjects between 1775 and 1820 were: anatomy (frequently entitled "anatomy and physiology" or "anatomy, physiology, and surgery"), practical anatomy (dissections with demonstrations), surgery, chemistry, materia medica, the principles and practice of medicine, and midwifery, often including the diseases of women and children. In addition, instructors offered courses in a variety of supplementary subjects, such as botany, experimental philosophy, physiology, diseases of the eyes or teeth, and clinical lectures. By the middle of the nineteenth century the basics microanatomy of the body was accurately known.

(5) Gradually, but relentlessly, Bedside medicine gave way to Hospital medicine. (McVaugh, 1997; Vandenbroucke, 1998) The eighteenth century was undoubtedly the most remarkable period of hospital building in England, with twenty-nine new infirmaries erected in the provinces in the years 1736-1797, five London (1720-1745) and a further five in Scotland (1729-98). (Lane, 2001: 82) In 1827 John Abernethy observed, "Unquestionably hospitals are the best schools of medical instruction for in them we have the patient's conduct under control, and can regulate and closely trace the progress of disease... the practical knowledge of our profession is much more readily obtained in hospitals than it can be anywhere else." (Abernethy, 1827)

It should also be kept in mind that even when practical anatomy or dissection was not in vogue in Europe it was supplemented by anatomical drawings and atlases. In Paris, Modeville was using his *Anatomy* as the introductory part of a projected five-book *Surgery*. In the Book I on *Anatomy*, he writes (1304 A.D.), "The first of 13 figures by which alone the entire anatomy and inquiry into the human body can be demonstrated clearly... whole and dissected, from front and rear... internally and externally, separately

and integrally, in every way in which it is possible to be shown to human view." (MacKinney, 1962) The body, as easily understandable, was made inside out – the image of the body becomes perceptibly three-dimensional. Such a phenomenon was unthinkable in Indian context.

Another stalwart of medical revolution Laennec stressed on three points – (1) to identify a pathological condition in the cadaver through physical change in the organs; (2) to recognize the same condition in the living, if possible, through physical signs independent of symptoms, that is accompanying various disturbances of vital action; (3) to treat the disease with those remedies which experience has found to be most efficacious. (Ackernecht, 1967: 93) The basic question was succinctly addressed – the body was made inside out, not the body or 'body frame' as such.

Anatomical and tissue pathology played a central role in the transformation of Western medicine that began in the last decades of the eighteenth century. "The Hunterian school restructured the Morgagnian relationship between pathological anatomy and physiology by emphasizing knowledge of the dysfunction producing the lesion, as much as the lesion itself, and its disruptive effects on physiological equilibrium." (Keel, 1999) Ruth Richardson, in her seminal work, comments, "The hospital seems to have extended the offer of preferential hospital admission to the sick poor of parishes agreeing to grant the hospital exclusive use of parish dead." (Richardson, 2000: 242) Thus, we can deduce that the spread and mandatory acquisition of anatomical knowledge is intimately tied up with the rise and extension of hospital systems as the main vehicle of medical and clinical learning. In tandem with this development there occurred a sea change in the perception of the sick-man. "The vision of the sick-man institutionalized within the tenets of Bedside Medicine was that of conscious human totality – a viewpoint that transcended, not merely united, the distinction of psyche and soma found in modern medicine." (Jewson, 1976) Jewson also notes that, "The raw materials of medical theorizing now became the innumerable morbid events, occurring within the gross anatomical structures, which presented themselves to the clinical gaze on the crowded wards... The sick-man became a collection of synchronized organs, each with a specialized function." (Jewson, 1976: 229)

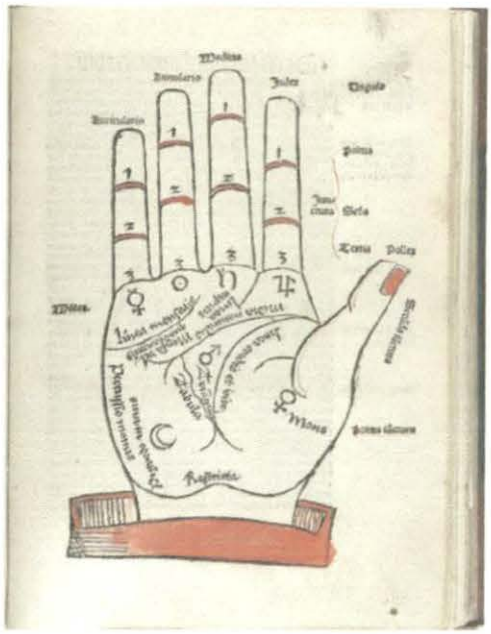
In an article of 1867, revealing new attitudes to scientific education, the *Lancet* contrasted methods of instruction based upon 'questions arising out of the cause of disease' with those relating to methods of cure. The English system placed the emphasis on the second approach. Students were called upon to 'act' before they 'had been taught to know'. More attention was required to the laws of physical science, anatomy and chemistry, structure and function. Students should understand scientific principles; unfortunately 'young men often aimed at being practical and were contemptuous of a more basic approach', adopting the attitudes of some of their seniors. The *Lancet* epitomized the aim of continental education as the production of a 'capable inquirer', while the English system produced 'a capable practitioner'. Neither alone was sufficient. (*Lancet*, 1867) Early nineteenth-century medical training was extremely diverse. While some practitioners held university degrees from the most respected medical colleges of the world, some were apprenticed to apothecaries where they "spent most of their time capping bottles and rolling pills." (Youngson, 1979: 12) Still others were quacks and drug peddlers who practiced freely with no legal sanctions against them. These kinds of practices were to change with the passing of the Medical Act Amendment Act of 1886. Gone were the antics such as "Steeplechases in the dissecting room, cheating on the Latin examination, flirting with the barmaid, gin-and water until three o'clock in the morning." By the 1880's, these stereotypical university scenes were replaced by "a new image of the medical student: surrounded by books, a model of human skull at his elbow, he labored over his studies with gravity and decorum late in to the night." (Peterson, 1978: 40) Increasingly, the hospitals were conceived, not just as a way of mediating the politics of obligation, but also as a way of imposing a strict and salutary moral discipline on the inmates. "Medical practice in 1870, we argue, was structured chiefly around individualized competition for patients at the lower end of the profession, and around a close-knit network of elite patronage at the upper end." (Sturdy and Cooter, 1998) With all these characteristics, the British medicine arrived in India. In Indian context a new era of medicine began to emerge.

This era was also replete with wars – both short and long terms. It did rewrite the history of medicine and Indian subjectivity forever. I shall now proceed to the depth of the matter. But, before that, I shall try to explain the question of anatomical knowledge,

health and disease perception in Āyurveda. In this paper I hope to specifically focus on: (I) the shaping of transformatory perceptions about the three-dimensional body vis-à-vis the two-dimensional body-frame in Āyurvedic education, (II) localization of *space* (in the form of anatomical pathology as poised against Āyurvedic humoral pathology) and *time* (in the form of both anatomical physiology against humoral physiology and the production of clinical *charts* in hospitalized patients), and (III) creation of medical professional authority outreaching people through teaching institutions, dispensaries, hospitals, cantonments, asylums, and jails and also through private practice.

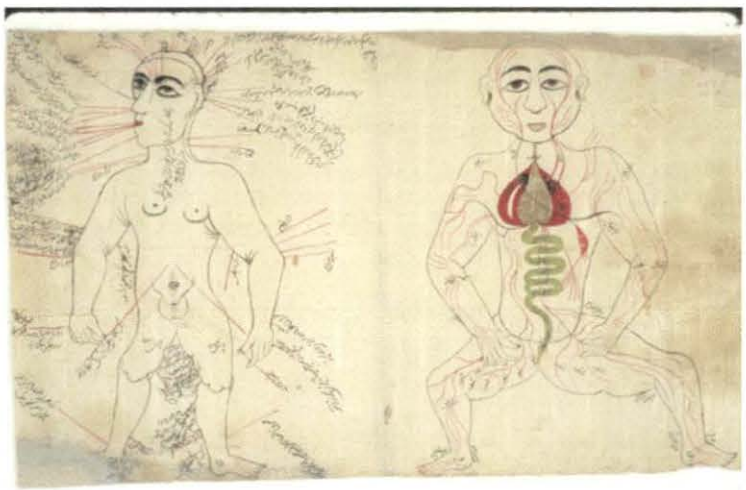
Now let us have a look at the Gray's Anatomy – 1st edition of 1858 – as an exemplary modern anatomical treatise. The book Gray and Carter (illustrator of that historical production) created was simply organized and well designed. The beauty of Carter's illustrations resides in their diagrammatic clarity, quite atypical for their time. Again, in the tradition of Enlightenment anatomy, the passive voice revels on the page, erasing any agent whose presence (whose body) might corrupt the objective aim of scientific description. The description itself is so detailed and precise that language becomes euphemistic; the human quality of the body is stripped away so that Gray may write, "To demonstrate the various fibres of the tongue, the organ should be subjected to prolonged boiling..." and a reader doesn't flinch, doesn't picture a glass specimen jar on a hotplate in which a tongue slowly rises and revolves on bubbles of boiling water. Gray's rhetoric is representative of the scientific worldview that sees the body's functions as derived from the body's structure. So, one's voice, for example, is simply due to an arrangement of muscular fibers in the tongue and the action of muscles in the larynx. Gray ignores what else the tongue may do – a lick, a kiss – and further ignores how the voice may be used or silenced. (Schuette–Hoffman, 2006: 70) Simply put, the *person* of the patient becomes divorced from his/her personhood. It becomes objectified and objectifiable, reducible to any number of anatomical organs. Extended further along this line of argument it has been aptly termed as "A reductionist and contagionist turn in medical knowledge and practice." (Worboys, 2007: 34)

Some interesting drawings of human anatomy across ages can be reproduced here. How perception of the body differed between Eastern and Western conceptualization should be clear from these illustrations.



[**Fig. 14** Hundt, Magnus. *Antropologium de hominis dignitate, natura et proprietatibus, de elementis, partibus et membris humani corporis*. (Leipzig: Wolfgang Stöckel, 1501). We must note accurate surface anatomical representation of the hand even in 1501.

Courtesy: National Library of Medicine – *Historical Anatomies on the Web*.]



[**Fig. 15** Anonymous *Persian Anatomical Illustrations*. [Iran or Pakistan, ca. 1680-1750. This figure is representative of Eastern anatomical drawings bereft of accurate dimensions of the organs.

Courtesy: National Library of Medicine – *Historical Anatomies on the Web*]

III Introduction of Medical Knowledge in Colonial India

In his famous letter of December 11 1823 Ram Mohan Roy, one of the pioneers of Indian 'Renaissance', wrote to Lord Amherst, "this sum (i.e. fund allocated for Sanskrit education in Bengal) should be laid out in employing European Gentlemen of talents and education to instruct the natives of India in Mathematics, Natural Philosophy, Chemistry *Anatomy* and other useful sciences..." (Roy, 1973: 834) This letter perhaps sets the tune of the Bengali elite's attitude towards Western education in India. Moreover, in 1822 Ram Mohan Roy sent a selection of 12 'Hindoo crania' to be examined by Dr. George Paterson. (Paterson, 1824) [On this occasion, Ram Mohan wrote a letter to Dr. Patterson –

Dear Sir,- I regret that I should have forgotten the commission with which you honoured me, some time ago, and feel ashamed of myself for such omission. I now have the pleasure of sending you ten accompanying skulls; and if you find them calculated to answer purpose, I will, with equal pleasure, send you as many as you may think sufficient for your present researches. If you wish me to procure you skulls of different descriptions, you will have the goodness to particularize them, that I seek an opportunity of meeting your wishes.

"Owing to a variety of engagements, I have not hitherto been able to fulfill my intention to pay you a visit, an honour which, I hope, I shall be able to do myself, without much delay. In the mean time, I have the honour to remain, dear Sir, yours most obediently, Ram Mohan Roy. 10th March 1822. (*Transactions of the Phrenological Society*, 1824)]

It is interesting to note, "Rammohan Roy's skull was also studied by the Edinburgh phrenologists after his death in Bristol in 1833 and was found to show "dignity of character."" (Veer, 2001: 146)

Another example may be had from Christian missionary Alexander Duff's endeavor to spread English education in India. "Previously, Hindus, believing their scriptures forbade the touching of a dead body, had always learnt anatomy from models and would not practice dissection. A deputation of teachers from an earlier established medical school and a committee of enquiry appointed by the Government visited Duff's college and asked the students their opinions. They replied that the English education

they were receiving had freed their minds from prejudice and the dissection of the human bodies was not objectionable to them. This attitude towards dissection had profound significance." (Emmot, 1965) An interesting episode can be cited here. Once, this very Committee came to visit Alexander Duff's school. They asked the students of Duff's school "Have you not also *medical Shasters*, which profess to teach everything connected with healing art?" "Oh yes," they said, "but these are in the keeping of Bhoido or physician caste; none of us belong to that caste, so that we do not know much about them." "Do your doctors learn or practise what we call *anatomy*...?" "We have heard them say that anatomy is taught in the Shasters, but it cannot be like *your anatomy*." They asserted that as touching of dead body is forbidden by imperative rules "so that from examination of the dead body our doctors can learn nothing about the real structure of the human body." They also confirmed "but we look upon this as nonsense." The committee then asked, "Would you actually be prepared *to touch a dead body for the study of anatomy*?" The head youth of the class replied, "Most certainly." As a result of this inspection "The commissioners were highly gratified. The result of their inquiry exceeded their most sanguine expectation." (Smith, 1879: 214-218) This inspection makes open a trajectory through medical knowledge in India, at least amongst the elite, journeyed from 'Shaster' to science. The aim of the medical curriculum was avowedly "not intended merely to supply the wants of the State but of the people, and to become a moral engine of great utility." (Smith, 1879: 217)

Consequently, an insidious change occurred within the texts of Āyurveda, "The primitive meaning which can be restored does not indicate quite surely the derivative meanings in which the words have been used in the texts." (Filliozat, 1964: 144) Rahul Peter Das addresses the same problem of interpretation, "'Āyurveda' today often refers to a modern syncretic system in many ways very different from the Āyurveda of pre-colonial times, heterogeneous as this may have been." (Das, 2003b: 30) By now, it is understandable that till the introduction modern medical knowledge in India Āyurvedic practices comprised of teachings of different Indian philosophical thoughts. Arguably, in Āyurveda Vaiśeṣika and Sāṃkhya *darśanas* are constructed according to its own medical perspective, making it conducive to medical application and thought. Larson argues, "In discussion of 'essence' (*sāmānya*) and 'particularity' (*viśeṣa*), for example, in the

Sūtrasthāna portion of *Caraka* (1.1.45 and the following pages), these terms are not employed in their correct philosophical usage as categorical notions in ontology and epistemology, but, rather, as organic notions having to do with homeostasis and the disruption of homeostasis in a living body." (Larson, 1987: 1-2) This very mode of philosophical and logical learning of Indian medicine was fundamentally reconstituted by new tools of knowledge based primarily on Baconian philosophy of 'ordered experience' on the one hand, and utilitarian attitude toward learning on the other. Lord Macaulay and William Bentinck were first of the two utilitarians in India. "The first to declare that India needed a Bacon was Akshay Kumar Datta." Rajendralal Mitra was the other person. The fourth issue of *Vividartha* edited by him carried a long article on the "Baconian System of Philosophy". (Kumar, 2006: 60) Around 1600, Francis Bacon (1561–1626) distinguished between 'ordinary experience', based on chance observations and therefore subjective, and 'ordered experience', based on the results of methodological investigation and aspiring to a certain form of objectivity. (Tröhler, 2001: 42-45) Here, we can take some stocktaking of prevailing Indian mode of general education in Bengal of that period, "At the end of the course on credentials passed from teacher to student – the student's accomplishments were sufficient testimony to his proficiency." (Di Biona, 1981: 206) The Rev. William Adam, who found 2632 schools in a population of 5,875,000 persons, or 1 school to every 3230 inhabitants, carried out a survey in selected areas in Bengal and Bihar. (O'Malley, 1941: 649) He found that there existed about 1, 00, 00 village schools in Bengal and Bihar around the 1830s. (Williams, 1838)

Climatic challenge in India was another formidable factor which the British had to encounter. The time roughly between the middle of eighteenth and nineteenth centuries is crucial in the emergence of cultural construction of disease. "The geography of nations was now rewritten in terms of the language of health, disease, and medical technology." (Bewell, 1999: 30) The British lost their three quarters of troops, most of whom were Indian sepoys, from disease. It is reported, "the muscles and sinews of man could not hold against the perseverance of the boiling kettle..." (Headrick, 1981: 20-21) In this milieu, "The health of people's bodies would be guaranteed by ensuring the health of their physical environment." (Bewell, 1999: 31) The army and navy and the East India Company required large numbers of medical officers. These services offered situations

and advancement for large numbers of young men, and not only during the French wars. The army employed just 142 surgeons in 1793 but over 950 by 1815. Indian situations increased as the Company's domains grew. In 1793 the Bengal presidency directory listed 155 surgeons. By 1837 it included 379. Some of the assistants of 1793 had become full surgeons by 1816 but not many. The mortality of Indian service ensured that each year the Company's directors sought replacements, and the Company's 'Cadet papers' demonstrate there was no shortage of applicants. "Thomas Goldie Scott who arrived in Bengal as an assistant surgeon in the early-1840s received a discouraging letter from his father soon after. 'There is no doubt that the Indian Service offers great advantages', William Scott mused, 'but then how few live to reach that point ... '" (Stanley, 2003: 24)

It was the native's body which was of utmost importance to explore – the interiors of the body – to protect the colonial regime from contamination and, also, from unknown diseases. Moreover, "the imperialistic culture which offers the same metaphors to scientists and novelists, shapes both biology and literature by shaping the language through they express themselves." (Otis, 2000: 3) These metaphors were very often expressed in terms of *military* metaphors, metaphors of invasion like 'microbe hunters', 'interior resistance' etc. Such aggressive expressions were non-existent in āyurvedic notions – be it of body, health, disease, pathology or treatment. Ontologically, it carried the notion of man-nature harmony within its conceptual framework. (Zimmermann, 1999)

Against this backdrop, the Medical College of Calcutta was opened in 1835. Calcutta Medical College was the first institution in India imparting a systematic education in western medicine. The British East India Company established the Indian Medical Service (IMS) as early as 1764 to look after Europeans in British India IMS officers headed military and civilian hospitals in Bombay, Calcutta and Madras, and also accompanied the Company's ships and army. A utilitarian approach and the need to provide expert apothecaries, compounders, and dressers in different hospitals prompted the earliest official involvement with medical education in India. These subordinate assistants would help European doctors and surgeons who looked after the health of European civilians and military employees and also reduce the company's financial burdens by limiting the appointment of European doctors. Even the great scientist C. V.

Raman had to trenchantly comment against colonial educational policy, "The influence of powerful British interests which desired that India should be a producer of raw products and a consumer of British manufactures also tended in the same direction, namely, that of restricting engineering and scientific education in India to the minimum necessary for carrying on the British administration." (Raman, 1944: 42) In 1827 John Tyler, an Orientalist and the first superintendent of the Native Medical Institution (founded in 1820s) started lectures on Mathematics and Anatomy at the Sanskrit College. In general, the medical education provided by the colonial state at this stage involved parallel instructions in western and indigenous medical systems. Translation of western medical texts was encouraged and though dissection was not performed, clinical experience was a must. Trainee medical students had to attend different hospitals and dispensaries. Successful native doctors were absorbed into government jobs. But, "Anatomy was very imperfectly taught from plates and models and it was thought the vernacular medium did not further advance study and assimilation of the great treatises of European Medicine." (*Medical College Centenary Volume*, 1935: 7) The committee appointed for this purpose observed that "the entire omission of practical human anatomy in the course of medicine" (Crawford, 1914: 435) had resulted in a poor quality of medical students who would never be able to work at par with the English doctors required in the battle fields and for the governance of health of the subjugated people to be disciplined. Specifically speaking in Indian context, indigenous and Western systems of medicine had been congruous until the early nineteenth century, but anatomical study, cadaveric dissection, pathological anatomy and other developments in Western medicine had created a gulf that was never to be bridged. (Harrison, 2006) Surgical practices premised on modern anatomical knowledge was the fundamental distinguishing point between these two medical traditions. Indigenous practitioners were regarded as a danger from which the population had to be protected. (Hochmuth, 2006: 44)

As early as 1826 (during the period of Native Medical Institution) Dr. Breton wrote to Dr. Gilchrist, "Of all the sciences studied by the Asiatics, that of anatomy and medicine is the least understood and cultivated..." It was observed in the same letter, "Native doctors became indispensably necessary to afford medical aid to the *numerous detachments* from corps in the extensive dominion of India...The anatomical plates and

works published from time to time, for the use of the Native students..." (Breton, 1826: 24)

In another account it was revealed, "Indian medical establishment amounts to *seven-hundred and thirty* surgeons and assistant surgeons, and compare the number of these functionaries with the duties which they have to perform..." (*Parbury's Oriental Herald and Colonial Intelligencer*, 1835: 251) With the same breath, it was also noted, "the Brahmin and Hindoo youths amongst these medical students, have so completely overcome their prejudices as *to study anatomy from dead subjects by dissection*, with as much ardour as any pupil of a London hospital, the time is approaching when the higher duties of the profession...be left to native practitioners thus educated; in surgical operations, the delicacy of hand, and sharpness of eye *which distinguish the natives*, will, when combined with *competent knowledge*, render them *superior* even to the European practitioners." (*Parbury's Oriental Herald and Colonial Intelligencer*, 1835: 250-251)

In 1807 Dr. Buchanan – an East India Company doctor – observed, "Medicine is taught by several of Pandits, some of whom also, although they are *grammarians*, practise the art...has always been exclusively *literary* in character...and from *oral* tradition." (Mukhopadhyaya, 1974, Vol. II: 14) Dr. Martin found four types of Baidyas in Purnea – Atai Baidyas; or doctors who defraud the ignorant; Dehati Baidyas or village doctor; Chasa Baidyas or plough doctors; Haturya Baidyas or who attend the market. (Martin, 1838, Vol. III: 142) Important in his account is the reference to the presence of village physicians who also teach grammar, these physicians take up this profession as family art; some physicians do not practice medicine at all, but teach. Expectedly, these physicians never practice surgery, better not to speak of anatomy. They all deal with herbs and charms. Anatomical pathology or the notion of three-dimensional mapping of the body was completely absent.

Even Japan's experience of "introducing the very notion of anatomical approach to the body – the idea of visual inspection in dissection as the primary and most essential way of understanding the nature of the human body" was not found here. (Kuriyama, 1993) David Arnold notes, "the medical texts of early nineteenth-century India constitute an extended exercise in comparative physiology and pathology in which European and Indian bodies are constantly compared (despite the difficulty of obtaining Indian bodies

for dissection)." (Arnold, 2004: 257) He goes on to add, "colonial India became increasingly active in providing the kinds of anatomical data required in Europe, even to the extent of meeting its thirst for *human skulls*." (Arnold, 2004: 268) Interestingly, in 1935 – the year of foundation of Medical College, Calcutta – the English practitioner Edwin Lee commented, "the bodies of patients dying in the hospitals are examined, immense opportunities are afforded for the advancement of morbid anatomy..." (Waddington, 1973: 221) In the most sought after book for Medical College during that period was *The Anatomist's Vade-Mecum*. Robert Hooper wrote, "Fortunately for mankind, Anatomy is now become an indispensable branch of medical science; and throughout Europe we have every where distinguished teachers, who are daily adding to the stock of useful information." (Hooper, 1802: xx)

Dissection was required in every session (over 500 cadavers used in 1851) in addition to six terms of anatomy. "But to permeate the consciousness of the Indian masses, applied science in the form of surgery (*anatomy*) and the treatment of diseases (botany and chemistry) had to be successfully practiced by the doctor-scientists trained in Western methods." (Gorman, 1988: 295) Dr. H. H. Goodeve in his introductory lectures in 1848 remarked, "in less than two years from the foundation of the college, practical anatomy has completely become a portion of the necessary studies of the Hindu medical students as amongst their brethren in Europe and America. The practice of dissection has since advanced so rapidly that the magnificent rooms erected four years since, in which upwards of 500 bodies were dissected and operated upon in the course of last year, now amounting to upwards of 250 youths of all ...religions, and castes...as the more homogeneous frequenters of an European school." (*Medical College Centenary Volume*, 1935: 14) Bucklnad wrote, "...a large proportion of the corpses, instead of being burnt, were either thrown into the river, or consigned for dissection to the Medical College hospital, to be afterwards disposed of in the same way." (Buckland, 1901: 296) Think of the scenario! Though the first dissection was greeted with gun-salute, it also resulted in some amount popular furor. (Shastri, 2007: 105) George Smith writes, "How did Duff's Brahmin students and those of the Hindu college stand the test of time for the first dissection...the college gates were closed to prevent popular interruption of the awful act!" (Smith, 1879: 217-218) If we consider the actual practice of dissection, the

following account may be recollected. According to Mr. J. W. Kaye, "In 1837 – the first year of which a record was kept – sixty bodies were dissected before the students. In the next year, it was precisely doubled. In 1844 the number had risen to upwards of 500. The College (i.e. Medical College, Calcutta) was popular. There was evidently a strong desire on the part of the native youths for medical and surgical knowledge." (Deb, 1977: 70) Another report reads thus, "Flourishing the state of Medical College of Bengal... In another account, "It is deserving of mention, that from the month of November, 1846, to that of March, 1847, being a period of only five months, nearly 500 bodies had been dissected by the native students,--an astonishing number, when the prejudice to be overcome is considered..." (*London Medical Gazette*, 1847: 127) Within a span of 10 years, the number dead bodies available for dissection amounted to more than 500. In the first year of dissection, there were only 20 bodies available. "This was due in the first instance to a virtually unlimited supply of cadavers. From the humanitarian viewpoint this was a regrettable situation, but the fact is that the Indian medical student was at an advantage over his counter parts in Europe and America." (Gorman, 1988: 285-286) Advancement of anatomical education was made at the cost of the unclaimed bodies the poor Indian people. There was no like of Anatomy Act 1832 of UK to restrain the supply of the poor and wretched Indian dead bodies for the purpose of dissection. (Richardson, 2000) Only a handful exceptional people like Jeremy Bentham did donate their bodies for anatomical dissection. The dead bodies of the destitute would provide the entire supply of dead bodies in the government institutions and private medical schools in UK. (Richardson and Hurwitz, 1987)

In his "Introductory Address delivered at the opening of the Calcutta Medical College, March 17, 1836" M. J. Bramley, the Principal of the College, solemnly told his audience, "To practice medicine alone, to say nothing of surgery, without a knowledge of anatomy, would be as if mariner were to attempt to circumnavigate the world without either chart or compass." (*Calcutta Monthly Journal*, 1837: 5) He continued, "Look at the vast department of surgery, occupied by whom? By ignorant beings who know not a vein from artery, and who could not secure a comparatively small blood-vessel, however alarming the hemorrhage might be." (*Calcutta Monthly Journal*, 1837: xix) The particular terminology 'beings' must be taken into account. He was most likely talking of

the Native pundits who were during the time were employed in the College to assist English surgeons in translating their lecture into Bengali or other Indian languages. In this haughty note deep hatred for Indian medical knowledge deficient in anatomical proficiency is quite evident.

Dr. H. H. Goodeve, in his 'Introductory Lecture' on the same day at Medical College, told, "In the study of anatomy you, for the most part, require the exercise of memory only..." (*Calcutta Monthly Journal*, 1837: 19) Indian pupils coming to attend the classes at the Medical College were already trained in 'mnemonic verses' of Sanskrit texts. So, as might be assumed, there was not much difficulty in cramming European anatomical terms and teachings. He also told, "The trade of the quack will fail; he will be compelled to educate himself rationally and study his profession as science, or starve...Be assured that the formation of this noble institution...will be *death-blow to the reign of empiricism in India...*" (Ibid, 20) Needless to say, 'quacks' stand for āyurvedic practitioners and 'reign of empiricism' simply means gradual abolition of Āyurveda itself. Further, "The medical art in India, such as it is, is founded upon no knowledge of anatomy, no principles of physiology. It is utterly devoid of all pathological research – objects which must necessarily form the basis of all scientific enquiries upon the subject." (Ibid, 20) It is intriguing to note how scientific medical knowledge was going to be the only parameter of knowledge. And, most likely, āyurvedic practitioners are being equated with quacks. Like some other important experiments done and verified for the first time on the soil of India, the division between 'physic' and surgery was resolved for the first time at Medical College. In Goodeve's own language, "In former days physic was deemed a noble science, while surgery was considered a mere mechanical drudgery...In England, however, more especially in London, the separation still exists to a great extent." (Ibid, 20-21)

Only exceptional note at that session was the lecture on "General chemistry and natural philosophy" by W. B. O'Shaughnessy. He stressed on the learning of scientific knowledge as the tool to become independent of foreign dependence. (*Calcutta Monthly Journal*, 1837: 7-18)

To remember, "None of the colonies had replicated the British way of dealing the destitute poor by providing indoor relief to paupers in workhouses." (MacDonald, 2007:

49) The singular act of introduction of dissection-based anatomical knowledge in medical education brought in some permanent and indelible changes in the perception of body, disease, personhood and self of Indian population. This scientific breakthrough had enormous sociological consequences, for it opened the door of western medicine to the natives of India as practitioners and beneficiaries. (O'Malley, 1941: 366-369) O'Malley points out that dissection at the Calcutta Medical College was another example of the spirit of accommodation of Hinduism in the confrontation of the caste system with Western practice. This very act reconstituted 'psychologized' epistemology of Indian knowledge in favor of objective, value-neutral, clinical detachment. As dissection became the primary means to know the human body, the living body was regarded in bio-medicine as a kind of 'animated corpse'. The dissector/doctor claimed the status of an epistemologically privileged cultural arbiter on the question of death and dying. In colonial India, unlike England, this education was intended to produce 'capable practitioners' instead of a mix of 'capable enquirers and practitioners'. The study of anatomy entailed a division among: (a) disease and non-disease, (b) science, reason, and modernity on the one hand; and superstition, tradition, and backwardness on the other; and (c) physicians and non-physicians and social hierarchy among modern medical practitioners and all other indigenous practitioners. (*Indian Medical Gazette*, 1868: 87) The specific report "A Plea for Hakeems" categorically notes, "Under the British Rule, however, they (i.e. all types of traditional practitioners) have disappeared altogether from political life and socially have little or no standing in European society where they are virtually ignored."

The lived experience of the body was reconstructed to become measurable and repairable. The body became a three-dimensional space (not a two-dimensional physical frame through which saps and humours flow, as perceived in Āyurveda) into the depth of which temporal marks of disease could be excavated through the study of pathological anatomy. Physiology was understood to be changes in organic activities over *time* within a circumscribed *space*. In India too, medicine, like pre-industrial Europe, was inextricably linked to larger rhythms and to the community. Again, in scholarship in the Western tradition the sensitivity for temporal ordering dominates more and more. (Houben, 2002) Time perceived to the level of a fundamental principle probably reflects

the development of an agricultural economy. (Nakamura, 1992: 64) Time acquired new meaning and disciplinary authority through an equally abrupt entry of clocks and watches, and there was among some a sense of moving forward in consonance with its linear progress. Consequently, the learned literate knowledge/unlearned oral wisdom polarity arose.

Among many other things contact with a culture with superior perception of time, rationality and science instilled through its education and language – far removed from everyday speech and perception – helped create this unique ethos. (Srkar, 2002: 287) "The next significant technology of medicine to use time as its orienting focus is the clinical chart...Clinical charts thus provided clinicians with a comparative and comprehensive perspective on how their interventions influenced the illness, and so became visual health outcomes records." (Reiser, 2001: 33) We should recall that (a) examination of pulse was reframed within a rubric of 'universalized' time, rate/minute, though, not in its descriptive character as practiced by the āyurvedic healer (Lad, 2007), and (b) the use of stethoscope was instrumental to diagnose anatomo-physiological dys-functions inside the depth of the body (i.e. organ localization of disease) and ushered in miraculous *therapeutic* results instead of *prognosis* in āyurvedic practice. In addition, to add, all these were results of accurate anatomical knowledge of modern medicine.

It is useful to note that even in 18th century England the classical authors like Hippocrates and Galen "remained the standard works read by medical students at the English universities." (Jewson, 1974: 372) Now, regarding modern medicine it has used the *word* and the *line* to grasp the fleeting biographical and biological moments that fill and define the lives of the patients. In Indian context it entailed changes within two important aspects of Āyurveda: (a) narrative of illness – one of the two components of the 2-dimensional body – became marginalized, and (b) biological moments definable and compatible with humoral vicissitudes in āyurvedic medicine got stripped of its core and, consequently, reconstituted as an objective, replicable and reproducible data which correspond to the depth (volume) of the 3-dimensional body within which anatomical organs are localized. In Richardson's analysis, "Corpses used in medical education are traditionally "depersonalized and biography-less"...The humanity of disembodied specimens is easy to overlook, even to deny." (Richrdason, 2000a)

Papers on autopsy to corroborate clinical findings during disease were being regularly reported in the journal of *Medical and Physical Society of Calcutta.* One example can be cited now. At a meeting of the Society held on 7 February 1829, Mr. Agnew presented "a case of diseased heart with an account of dissection." (*Asiatic Journal and Monthly Register*, 1829: 323) Possibly, the example of Soorjo Coomar Goodeve Chuckerbutty best illustrates the fact of acquiring new knowledge of anatomy and dissection by the native students to find pathologies inside and to make correspondence with disease causation. One of his papers on heart disease was entitled "The Connection between Rheumatism, Pericarditis and Jaundice." In October 1864, he described twelve cases of long continued fever associated with maculated mulberry rash on the trunk, dusky red hue of the face, neck and hands. Postmortem was done. "The case records, post-mortem findings, critical analysis of symptoms presented in the paper, show that the diagnosis was very probably correct and thus this was the first account of typhus fever in India." (Sengupta, 1970: 186)

In medicine and related subjects, for example, students' interests and competence in dissection led to the establishment in as early as 1831 of a small hospital. One graduate, N. K. Gupta, who had been trained as an apothecary was apparently doing quite well in that position at the hospital. Other students trained as assistant surgeons were regularly attending "99 House Patients and 158 out ones." (Kopf, 1969: 184) In another account, we find that there were increasing numbers of "Surgical operations performed for expiration of tumours from various parts of the body, removing of cancer and other malignant parts, tying arteries..." Such measures, according to Dr. F. H. Brett, bear "sufficient evidence to prove what great benefit might be conferred on those destitute *creatures* by a well conducted and liberally supported institution, for as their confidence increases, and the means of relieving their wants, their number will also be greatly augmented." (*General Committee of the Fever Hospital and Municipal Improvements*, Vol. 7: 205) He emphasizes the superiority of 'Hospitals' over 'Dispensaries' in that article. Greatly relieved of their incurable diseases (amenable to simple surgeries in most cases) people, with their mixed feeling of awe, skepticism and reverence were getting inclined towards European hospitals. Mainly the 'destitute creatures' were the first of goers to these hospitals and dispensaries. Contemporary public press began to

manufacture opinion in favour of European surgery and therapeutics. (*Samachar Darpan*, 19 December 1835) Marginalization of the colonized people within the discourse of their own country is a legacy of colonialism that has proved difficult to eradicate; in India of the 1830s, this was just beginning. (Khaleeli, 2001) In Arnold's analysis, "Annesley and Twining were among the nineteenth-century physicians who saw themselves as contributing through their 'patient industry' to a wider scientific community beyond India as well as providing more immediate practical guidance for colleagues newly arrived from 'home'." (Arnold, 1995: 19) If the body can be separated from a person's selfhood and controlled, it can be corrected and improved. Medicine becomes a proper theme in development. (Nandy, 1995)

Some interesting facts can be cited here. For instructing modern medical knowledge to native students new hospitals were constructed. It served a number of purposes, namely – (i) carrying out dissection of the wretched and unclaimed bodies of poor Indians which was never possible within a system of āyurvedic *tols* and *gurukul* system, (Acharya, 1994) (ii) traditional educational practice of *text-as-authority* was reconstituted to learning through Baconian 'ordered experience' and experiment of clinical medicine, and (iii) as an offshoot of Christian charity, hospitals became the centers where the patient-as-object could be measured, repaired and experimented in a detached setting – away from his/her familiar domestic environment. Bedside medicine yielded to Hospital and, consequently, Laboratory medicine. Some interesting facts may be adduced here. The establishment of the Calcutta Medical College was a landmark in the development of scientific education in Bengal. The lecture was open to public and, it appears, these were attended. The amateur audience included in the early years of the college a very remarkable person, Akshay Kumar Datta. He became a major influence on the intellectual life of nineteenth-century Bengalis. (Ray Chaudhuri, 1996: 52) His Bengali book *Bahya Bastur Sahit Manab Prakritir Sambandha Bichar* (The Relationship of Human Nature with External Objects) is almost a direct transcription from George Coombe's *The Constitution of Man considered in relation to External Objects* (published in 1828 and sold approximately 3,50,000 copies between 1828 and 1900). Datta had only substituted and supplemented Coombe's data drawn from the European experience with evidence nearer home. Coombe's book itself was influenced by Baconian spirit and

heavily charged with 'positivist' and 'utilitarian' philosophies. Regarding Indian philosophers Datta woefully commented, "They were in want of someone to lead them. They were in need of one Bacon, one Bacon, and one Bacon."

The huge gap in figures of anatomical dissection, as discussed earlier, in Calcutta and London points to some glaring facts: (a) hospital admissions in the Medical College in Calcutta were of considerable number, (b) poor Indian destitute formed the bulk of this admission (and, ruefully enough, there was perhaps none to claim for their bodies after death in hospital and so could be used as an anatomical object for dissection), (c) there appeared well marked professional hierarchy at two levels – between indigenous practitioners and western-trained physicians on the one hand (Gupta, 1998), and between English and Indian physicians on the other. A report in this regard is informative, "In native society, all over the country, these men (i.e. traditional indigenous practitioners) have disappeared altogether from political life, and socially have little or no standing in European society, where they are virtually ignored." (*Indian Medical Gazette*, 1868: 87)

In 1839, before this situation emerged, Sir William Sleeman remarked, "there was not a considerable town or village without its practitioners, Hindu and Muslim. The educated classes sought the aid of European *surgeons* whenever they could obtain it, surgery being an art in which they felt *helpless*..." (O'Malley, 1941: 636) Regarding the rise of professionalism in medicine, Poonam Bala notes, "Regulation of medicine in India was to a great extent influenced by the policies in Britain at that time... In India, the medical profession can be seen as a branch of the Army medical services which held sway over the medical profession... While in Britain, State intervention was in terms of regulating private practice, in India, practitioners were in State employment." (Bala, 1991: 67, 69, 71; Arnold, 1996) The power of the medical profession lies in its success in having secured by political means a legal monopoly over the practice of healing in contemporary society. American experience reveals to us, "the identification of the profession with *autonomy* enabled the American profession to invest itself with the authority and prestige of the most advanced European medical science and distinguished itself from midwives, folk healers, the clergy, and other rivals." (Sappol, 2001: 2) In Indian context, the extent of ramification of medical ideas can be gauged to an extent by the number of medical journals. By the end of the nineteenth century there were as many

as fifty medical journals in the Indian languages. (Panikkar, 2001: 165) Between 1912 and 1917, a number of Medical acts set up Medical Councils in the various provinces, and laid down qualifications for registration of medical practitioners that excluded traditional physicians, and made it illegal for a registered practitioner to be associated with Indian medicine. (Patterson, 2001: 120)

A Bengali magazine *Jñānānveṣan* (Search for Knowledge) reports on 26 March 1836, "It is seen everyday how much harm is committed due to lack of just treatment. Lacking right treatment people are dying every hour due to fallacious knowledge of uneducated vaidyas. The number of people who are dying will possibly outnumber the total of dead people in India." (Bandyopadhyaya, 1994: 38) It reveals the attitude of a section of educated Bengali people towards traditional treatment. Even common people were not exempt from this sentiment or mindset. Though, questions of religious beliefs and local customs came up to confront the advent of Western medicine from its 'enclave' origin to public health program. Small pox, cholera and plague, to name a few, were such contested areas. (Bhattacharya, Harrison and Worboys, 2005) Nevertheless, powerful therapeutics of Western medicine and the introduction of anatomical knowledge in medical curricula tilted the dialogue between East and West towards the later. Western medical practice was involved with better social position and monetary gain.

So, patients, being increasingly divorced now from their domestic setting and transported to hospital setting, were made amenable to completely new technologies of time measurement and case histories. They began to experience an altogether different form of subjectivity – incomprehensible so far and aggressive. One example may further help to understand it. In a letter to the editor of The Englishman, an English man complains about Medical College and Hospitals, "Enter and you will find East Indians and West Indians, Bengalees and Madrasees...These creatures wear the same clothes, and lie on, and use, the same beds and beddings as the Europeans; and as soon as they don the clothes they are *yclept* sahibs! They are of all classes; and (as all patients are distinguished not by *name*, but by *numbers*), were one to ask for "Now Number Sahib"..." (Ray Choudhury, 1987: 4) Besides social hierarchy, it is interesting to note how patients became numbers. In other words, person was transformed into patient in the hospital setting. Person of the patient got transformed into pathology inside the body. It

reminds us of clinical objectification of modern medicine. It also reminds us of careful separation between the White and 'black' bodies.

IV Interface of Both Knowledge Systems and Reconstitution of Āyurvedic Knowledge

To know and combat diseases in alien environment the British had to depend on anatomical dissection of the native body on the one hand, and to control environment or the space surrounding the body. There occurred an epistemological break in the sense that there was no "perfect association between appearance and disease." (Fredriksen, 2002) A mechanistic model of the body compounded this in the aftermath of Newtonian revolution in physics, Cartesian philosophy, and Galilean mathematical explanation of physical bodies. A new paradigm emerged: models > logical deduction > theorem or result. However, the Indian approach remained to be: observation > algorithm > validated conclusion. (Narasimha, 2003)

In *Bengal Gazette*, 12 August 1780, a poem "*Calcutta in the Rains*" was published:

> Where insects settle on your meat,
> where scorpions crawl beneath your feet
> and deadly snakes infest;
> mosquito's ceaseless teasing sound
> and jackals' direful howl confound
> destroy your balmy rest. (Vernede, 1995: 70)

By the early nineteenth century, the "native of Bengal" had come to symbolize all that was despicable in the colonized race. The common illnesses reported were dysentery and various fevers, treated summarily by Company physicians with doses of brandy, mercury or bleeding. In March 1862, Prof. Longmore, of Netley, gave the following evidence before the Royal Commission on the sanitary state of the Indian Army, "As regards the chief part of this extensive city (Calcutta) – that inhabited by the native population – the pestilential condition of the surface-drains and yards, and many of the tanks among – the huts and houses, would not be credited by any one who had not been among them." (*Nature*, 1871: 150) In 1860, the cholera deaths were 6,553, and in 1866,

they were 6,823. The notion of geographical pathology was constructed which waited to be properly ordered and 'improved' by the Colonizers. What a comedy of errors, though willful and intentional!

In a similar way, the space of Calcutta and the bodies inside this space were fit into this project of 'improvement'. "Plants, minerals, morbid specimen, skulls, medicinal samples, natural history drawings and letters reached these institutions (like the Asiatic Society) in Calcutta, and from there, they often sailed ship to London, Edinburgh, and other metropolitan centers." (Pande, 2005) There were two faces of Calcutta – a pathological space, and the colonial centre of calculation (as Latour clinches the point).

To control this pathological space and to "civilize" the native bodies there came up the importance of public health emerging out of its 'enclave' origin. The focus of the nineteenth-century public health "became the zone which separated anatomical space from environmental space, and its regime of hygiene developed as the monitoring matter which crossed between these two great spaces..." (Armstrong, 1993) Sanitary science dissected the mass and recognized separable and calculable individuality in the form of anatomical/corporeal space in the crowd – though not the singularity of individual difference. Ignorance of Indian context is revealed in the 1st census of Indian Empire in 1871. Scholars have argued that "the wisdom of trying to impose on the Indian people a category – in this case, age – that worked well in a Western context but did not easily translate into useful data when exported abroad. In short, they realized that even so putatively 'universal' a category might be impossible to determine accurately in a culture that lacked certain assumptions about time, and in a state that lacked the resources to record the dates of births and deaths." (Alborn, 1999: 64) Ignorance became glaring when after the 1872 census in Bengal, Beverley, the provincial registrar, observed that "[t]he population of Bengal rose in one day from 42 to 67 millions," and quipped, "[t]he Lieutenant-Governor . . . suddenly found that he had unconsciously been the ruler of an additional population more than equal to that of the whole of England and Wales." Many books were written to guide the White settlers in India. One such was "Medical Hints for Hot Climates and For Those out of Reach of Professional Aid." (Heaton, 1897) Some of the suggestions were:

1) To get up late in the morning and take breakfast or light food at 11-30 am. "Do not eat too much at a time; i.e., be content with satiety and leave off with an appetite." (Heaton, 1897: 3-4)

2) To take regular bath.

3) To take decoction of *chirata* (a traditional herb used by Indians to increase appetite) and *bael* (it is mildly astringent and is used in India for dysentery and diarrhoea; the pulp may be eaten or the decoction administered. It is said to cure without creating any tendency to constipation.) (Heaton, 1897: 140) It was also observed, "there are certain days on which meat killed quickly turns putrid, and that such seasons have been noticed as marked by humidity, closeness, or stillness of the atmosphere." (Moore, 1862: 20) Therefore, local Indian knowledge was incorporated within the therapeutics of Western medicine for everyday purpose. But this had little effect on overall Western medical knowledge. When two culture groups come face to face they are confronted with the barrier of language. It hinders a deep and meaningful process of mutual appreciation and cultural exchange. When the British emerged to be the ruler of India, "The British mode of living in India provided cultural blocks to their acquisition of knowledge beyond their problem with language." (Cohn, 2004: 19) Hence, there was a deluge of translation of Indian texts. Therefore, "Seen as a corpus, these texts signal the invasion of an epistemological space occupied by a great number of diverse Indian scholars." (Cohn, 2004: 21)

It can be summarized as:

(1) At the interface of two cultures exchanges occur at various levels with different responses, namely, (a) upper echelons of a given society, (b) middle class, if any, and (c) lower rung of the society.

(2) More powerful culture (with its political and economic background) pursues the *modus operandi* through (a) *interaction* (or, knowing the object), (b) *assimilation* and *experimentation* (knowing the nature of the object – which turns out to be an ontological question), (c) *transformation* (reconstituting the object in an artificial environment), and (d) *dissemination* (exporting it to its root – original cultural context – which may be regarded as an epistemological question).

(3) In tandem with the last one (dissemination) dislocation occurs at idioms of expression or understanding in both the cultures. For example, while exploring Tropical medical space (including India) "germ theory" was dislocated by the rise of parasitology, and, finally, giving rise to Tropical Medicine. Simultaneously, there was reconstruction of Āyurvedic knowledge of anatomy and it began to be read and interpreted in the light of modern medical/anatomical knowledge. 'philosophical/speculative' anatomy was reconstituted by modern anatomical knowledge.

We shall now try to see how all these exchanges and changes occurred at the level of both epistemology and ontology of Indian knowledge pattern. While talking about the English East India Company, Patterson observes, "The early traders faced formidable medical problems, and, at first, they were eager to learn anything they could from the local medical practitioners...Faced with a continuing high mortality the Europeans noticed that Indians were relatively immune to some of the local diseases. This led to the policy of 'Indianisation': the attempt to make the blood of the Europeans more like that of the Indian, and so make him more resistant to Indian disease." (Patterson, 2001: 110) With the success of the first English expeditions, the import of drugs into England increased markedly: the portion of drugs imported from outside Europe in 1588 was 14%, in 1621 48% and in 1669 70%, of which the majority had come from India and the East Indies. (Patterson, 2001: 111) Connected closely with the issue of medicine was the question of botanical identification of plants and herbs in use for pharmacological purposes. Gerard Koenig, a student of Carl Linneaus, realized that a better understanding of Sanskrit would open the world of medical values of these plants. He observed, "Some hundreds of plants, which are yet imperfectly known to European botanists...grow wild on the plains and forests of India." (Baber, 1998: 56) Garcia de Orta's knowledge of Indian plants opened up a new world of Western botanical taxonomy. "The developing *British Pharmacopoeia* in Britain at the time was then a precursor to these developments." (Bala: 1991: 63) More evidences may be found from the use of Rauwolfia (Sommers, 1958) (*sarpagandha*) and cotton wool (which was originally produced in India) for wound dressing. (Elliott, 1957)

But at a later period during the mid-nineteenth century, things began to change. Western interest was confined not only to taxonomy or morphology of a plant. Plants

were scrutinized through chemical tests and to separate its constituents which could be artificially produced in laboratories and, then, in factories. John Stenhouse presented a paper before the Royal Society on December 6, 1855. The paper title was "Examination of select Vegetable Products from India. These Vegetable Products were *Datisca cannabina*, *Ptychotis Ajowan*, and *the Decamalee Gum of Scinde*. His effort for "last twelve months has been chiefly directed to three of these vegetable substances..." (Stenhouse, 1856)

Bala finds that the simultaneous flourishing of indigenous and Western forms of medicine was not only because of state patronage but also because of the similar basis of treatment and diagnosis so that one system did not threaten the other. But, after knowing the extracts of a plant and herb (along with synthetic chemical production of drugs) the chemical and drug industry in Britain flourished like giants. So, "the rise of the chemical and drug industry and the growing profession of medicine in Britain created a vast gulf between Indian and Western medical sciences which was getting wider day by day...it could not be breached." (Bala, 1991: 64) As mentioned earlier, the phase of interaction passed over to the phase of assimilation and experimentation and more. All these are carried to the 'centers of calculation' and "every domain enters the 'sure path of science' when its spokespersons have so many allies on their side. The tiny number of scientists is more than balanced by the large number of resources they are able to muster." (Latour, 1999: 232) Here, in the 'centers of calculation' these facts are standardized and "*additional* work is done inside the centers to mop up the inscriptions and reverse the balance of forces once more." (Latour, 1999: 233) Such recurring cycles, according to Latour, give metropolitan science its steadily increasing claims to universal knowledge.

During the first half of the nineteenth century, however, the drive for 'westernization', both secular and religious, had been growing. The only course for India was thought to lie in abandoning Indian ways, and arranging for all education to be on western lines. This resulted in a complete reversal of the earlier liberal attitude of Europeans to Indian culture, including medicine. (Patterson, 2001: 119) Thus, modern European science is ontologically linked to the growth of European colonialism. (Chakrabarti, 2004) This ontological question is also intertwined with centre-periphery epistemological question. Our assumptions about what it is to be human, about what it is

to be a person, correlate with deeply held convictions about what constitutes a human and a supposedly 'normal body.' (Canguilhem, 1978; Davis, 1995) During the mid-nineteenth century, the notion of the norm, of normalcy, and the normal body evolved. A 'normalizing regime' or 'regime of normalcy' emerged out of the idea that there exists a normal standard to which all bodies must and should conform. "Shifting power relationships in the colonies, together with new intellectual currents emanating from the metropole, wrought a profound change in the way Europeans came to see their *bodies* in relation to their subjects and the tropical *environment*." (Harrison, 1996)

Assimilation of modern Western anatomical ideas to explain internal dynamics of Āyurveda and to judge all ancient works in 'scientific' light (bearing equivalence to being 'civilized') gradually became the call of the day. Such an effort is perhaps aptly illustrated in a 1924 book *Sharir Parichay* (Introduction to Anatomy), purportedly to resurrect old Āyurvedic knowledge of anatomy, written by an eminent English-educated *kaviraj* Gananath Sen. (Sen, 1924)

In his book Gananath emphasized on a journey from atlas to cadaver to dissection for properly gaining anatomical knowledge. He informed the readers, "[anatomy] is first and foremost basis of Āyurveda." (Sen, 1924: 1) According to him, to gain comprehensive knowledge of a difficult subject like anatomy one must first learn from atlases and *gurupadesha* (advice from guru), "then through dissection that knowledge has to be testified. If one does not have any knowledge of the subject from the beginning only dissection cannot yield any fruitful result." (Sen, 1924: 2) Throughout the book, he reproduced diagrams and figures from different textbooks of anatomy taught in medical colleges. Ancient Āyurvedic anatomical terms of entirely different connotations were conflated with modern concepts. In his book, he quickly turned to discover examples of 'germ theory of disease' even in ancient Ayurvedic texts. Here 'germ theory' acted as a *metonymy* of power. As a result, he, perhaps inadvertently, opened up a space of Foucauldian clinical *gaze*. Through this new mode of conceptualization there occurred first, a spatial shift in perception from macrocosmic-microcosmic arrangement of the "Indian" body to the circumscribed, three-dimensional anatomical space, and second, a shift from traditional philosophy of *tri-doṣa* theory to 'modern' notion of organ localization of disease. In another of his later books, he told that 'renaissance' of

Āyurveda was brought about by the very act of cadaveric dissection by Madhusudan Gupta in 1836. (Sen, 1944: 31)

It was no wonder that the philosophical matrix of Āyurveda was dislocated through this 'modernization' of Āyurvedic knowledge of anatomy. Post-Renaissance medical concepts insinuated into the interstices of classical Āyurvedic concepts and reconstituted their meanings. Gananath's epistemological inquiries were surreptitiously assimilated and reconfigured by metonymic language-metaphors of modern anatomy. Consequently, the Āyurvedic body as a self-reflexive and active agency began to metamorphose into an inert dead body – an 'object'. It can be understood through Peircian concept of index-symbol-icon. It is through the reconstruction of the indexical parts of a sign system the entire symbolic order can be reconstructed insidiously – without changing the sign-uses of a local cosmos. Its use might spawn a rethinking of the symbol, a new idea, an idea that might change other ideas, change habits and hence change 'actual behavior in the outer world' in a continuous dialectical process. (Peirce, 1955: 283-288; Mines, 1977) Such a process was in operation and the Sanskritik connotations of organs described in Âyurveda were evacuated of its meanings. That vacuum was filled in by modern anatomical meanings and metaphors. Consequently, context-sensitive character of Āyurveda was metonymically refigured by context-free, universal logic of modern medicine. It was again enhanced by excellent therapeutic results and diagnostic aids like stethoscope, microscope, and x-ray. This becomes an illuminating example of how idioms of expression unique to a particular set of epistemology can be insidiously transformed and a new hegemony of text can operate. "In a complex civilization, as culture changes and innovations are introduced, healers and patients must continually adapt their perspectives to one another... healing systems adjust to the conditions imposed by the general culture and by one another." (Trawick, 1993: 133) Floating signifiers being substituted by circumscribed scientific metonymies led to where "contingent figures of chances masqueraded deceptively as figures of necessity" and "metonymies are assimilated with metaphors with which they are contiguously associated." (Culler, 1981: 220-222) In another instance Gananath Sen writes, "I am here to appeal to your justice to give Ayurveda its share of consideration in the great work of Renaissance set upon you by a kind Providence and benign Government ... We mean to

employ the lever of our Western education to turn over these ruins." (Sen, 1916) It was actually an address delivered at the Hindu University Foundation Ceremony, Benares.

A different example in this regard would be Kanailal Dey (Kanny Lall Dey, as he wrote of himself) who was a distinguished physician of the late nineteenth century. He lamented for excluding indigenous herbal drugs in the latest list of drugs by the Government of India, He, in a submissive note, beseeched that other indigenous drugs would be employed in the Medical Depots if they could be obtained pure and price not exceeding that at which they can be imported. (Dey, 1896)

As an aside, in another important Āyurvedic textbook published in 1890 the position of *garbhāśāya* (ovary) is thought to be in between *pittāśāya* (gall bladder) and *pakvāśāya* (stomach). (Sengupta and Sengupta, 1890: 10) Sheer lack of anatomical dissection and knowledge leads to such conclusions. Interestingly, unlike Gananath Sen the compilers of this book were not trained in English education. It must be remembered that the epistemological root of Āyurveda was constituted in pre-colonial social milieu. But it was getting dislocated and displaced in the new socio-economic context when the emergence of market was a formidable phenomenon to cope with. There was "An important trope, even in the nineteenth century" that deemed "India as a seat of decaying knowledge: this Indian knowledge was ultimately 'our' knowledge, though in a distorted form." (Bayly, 1994: 8)