

**ANATOMICAL KNOWLEDGE AND THE ANATOMY OF MEDICAL KNOWLEDGE
IN INDIA: SOME PRELIMINARY INQUIRIES***

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Objective

Much is known about the great medical discoveries or the great masters of medicine but very little on whether they were applied and, if so, in what context and to whom they were applied (Sigerist, 1912). Against this context, the objectives were set for this study: (1) the centrality of anatomical knowledge and the 'medical' body in medical education after the arrival of the British. The 'Indian' body was the very site of confrontation between the colonizing alien power and 'true' Indian ways of knowing the body through renewed study of ancient medical texts, (2) to understand how the construction of professional authority of biomedical practitioners over their indigenous counterparts occurred, (3) how this asymmetric exchange between two knowledge systems changed the ways of knowing the body in Āyurveda (Bhattacharya, 2004).

Plan of the Work

The paper covers three distinct movements with significant amount of overlaps. The first part examines the background and introduction of the study of anatomy in India and reconstruction of ideas about the body/health/disease consequent upon it. The second part examines the acquisition of spatial knowledge of the body along with its inherent rational clinical detachment, and how it influenced other branches of medicine. This involves a reading of numerous secondary and a good number of primary sources conjoined with archival work in Calcutta Medical College library, state archives (West Bengal), SSKM Hospital library, National Library of Medicine (AIIMS), Visva Bharati Central Library, Bangiya Sahitya Parishad Library and other archival resources. It also involves interviews

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with a select body of Āyurvedic practitioners. The newer understanding of medical education in general and the role of traditional anatomical study in particular has been analysed in the following chapters.

- I Locating the Thematic: Introduction
 - II Āyurvedic Knowledge of Anatomy: How to Understand the Body and Disease.
 - III Pre-colonial Period of Knowledge: Āyurveda and Anatomy.
 - IV Arrival of Western Medicine: Colonial Reconstruction of Medical Knowledge.
- V. Conclusion.

Modern/Western medicine in fact has passed through epistemological and paradigmatic shifts from Bedside medicine to Hospital medicine to Laboratory medicine (and, now, Techno-medicine). Having gained modern knowledge of anatomy, instead of previous two-dimensional perception of the body, disease began to be perceived to being located within a three-dimensional body. The singular act of post-mortem dissection differentiated Hospital medicine from Bedside medicine and established its unquestionable authority over Indian medical knowledge systems during the colonial period. Anatomy is a working science for problem solving and application in the practice and delivery of quality health care. The physical examination, medical imaging and other procedures, as well as the elements of the medical history, all generate clinical data that pertain to anatomical entities in the human body. In our era of medical education, raging debates are going on about the necessity of anatomical education in a traditional way: "To Dissect or Not to Dissect?". Against this perspective, while writing a history of encounters and syncretization between Western and Indian medical knowledges, it is not to look from an essentially pragmatic point of view, seeing them as technologies for managing illness and to be understood mainly in terms of efficacy. The study of human anatomy has signified many things to different cultures across the ages including religious purposes, and beside these practical preoccupations, a strong element of curiosity about the mysterious nature of human life and its mechanism. Furthermore, from a philosophical point of view, anatomy is not merely the structural biology of human species which happens to be human. Because we are self-aware the study of the human has a unique place in establishing the image we have of ourselves; ultimately the *prosaic descriptions* of the bones, muscles, blood

vessels and neural pathways are the *context* of our experience of life (Gray's Anatomy, 2000: 2. There are important and invaluable studies on the history of anatomy and anatomical knowledge in India (Sen, 1924, 1943; Sharma, 2000; Mukhopadhyaya, 1913; Meulenbeld and Wujastyk, 2001; Filliozat, 1964; Meulenbeld, 1999-2002; Wujastyk, 2009; Zimmermann, 1989; Zysk, 2000).

Interestingly, a good number of Indian studies are more concerned in some way or other in establishing the past glory of anatomical heritage in classical Āyurvedic medical texts. In a more recent study we find comments like “the Hindus were the first scientific cultivators of the most important and essential department of medical knowledge namely anatomy” (Rajagopal et al, 2002). Many more studies may be enumerated in favor of this particular mind set regarding anatomical knowledge in the so-called ‘Hindu’ or ancient medicine (Sen, 1924).

At this juncture, two issues should be taken into account. First, in stead of conceiving the body as solid and bounded (as in biomedicine), Āyurveda conceives the body as fluid and penetrable, engaged in continuous interchange with the social and natural environment. It is a living tradition which has provided (and still providing) healing and physical relief to millions of people across the ages. It has its own explanatory model. In many ways, Āyurveda represents Indian subjectivity too. Second, though principally related to medical matters, “Āyurveda is not a system of medicine” as compared with Western medicine, but a dynamic philosophy of life with the aid of which one can attain healthy individual and social life so as to perform the functions efficiently and fulfill the social obligations fully, at the end to attain perfect bliss of liberation.

To write a history of medicine of this genre is, to quote McKeown, “more than a blend of social history and medical history, more than medical developments seen in the social context of their period; it is essentially an operational approach which takes its terms of reference from difficulties confronting medicine in the present day” (McKeown, 1970).

The study of medicine in ancient India was the first momentous step forward from *daiva-byāpāśraya bheṣaja* to *yukti-byāpāśraya bheṣaja*. There are attempts at theorization in both *Caraka-* and *Suśruta-Saṃhitā* with regard to anatomical knowledge as well as knowledge of health and healing. But, to emphasize, in Āyurvedic knowledge, there is no single conception of the body, but a dominant one – a bodily frame – through which *doṣa*-s, *dhātu*-s and *mala*-s flow. Recent scholarships reveal that divine character of *āyurveda* does not

belong to its hard core, but has been imposed upon it during a particular stage of development serving as a disciplinary matrix to gain legitimacy from the religious society (Muelenbeld, 2001). But scholars working within a traditional framework have tended not to engage with the problem, because of the strong belief that Āyurveda is indeed a continuation of medicine from the Vedic *saṃhitās* (Wujastyk, 2003). History of human anatomy parallels that of medicine and has also been greatly influenced by various religions. The study of medicine in ancient India was the first momentous step forward from *daiva-byapasraya beṣaja* to *yukti-byapasraya bheṣaja* (Chattopadhyay, 1979). Anatomical study (and pharmacology too) was a potent tool for it. Directly perceptible results (*pratyakṣa-lakṣaṇa-phala*) constituted an important matrix of rational Indian medical approach. The doctrine of *tri-doṣa*, resembling “humoral” theory of Greek origin which was the predominant concept of Western medicine till the beginning of the nineteenth century, explained Āyurvedic disease causation. Rudimentary anatomical knowledge of the body helped shape its formation. Later on, after European renaissance, dissection-based anatomical analysis facilitated the classification of bodily components, the development of a vocabulary for describing the body with clarity and precision and mapping the bodily organs and their surface projections, which would be later used in physical diagnosis.

Without going into any details, I would highlight some important elements of anatomical ideas – with their lacunae and discrepancies as well – found in classical Āyurvedic texts like *Caraka-Saṃhitā*, *Susruta-Saṃhitā* and that of Vāgbhaṭa I (675-685 AD). These may be arranged as follows

- (1) “A comparison of Suśruta and Vāgbhaṭa I shows that the study of anatomy had almost ceased to exist in the latter’s time.” (Dasgupta, 1981: 433) As anatomical knowledge ceased to advance, medical education in ancient period had to base its theorization on rigorous reasoning derived from various philosophical sources instead of anatomical knowledge. The only mention of anatomical dissection in the whole history of Āyurveda is found in the *Suśruta Saṃhitā* (*Śārīrāsthāna*, 5.46-50). Interestingly, the procedure to prepare the dead body for acquisition of surgical knowledge was not *dissection*, it *avagharṣaṇa* – slowly scrubbing skin and other superficial structures with grass etc.
- (2) There are gross variations in estimates of bones and organs in human body in these texts. There are descriptions of over 300 bones (as against 206

bones in actual estimate)-90 tendons, 210 joints, 500 muscles, and so on (Rao, 1968). Suśruta himself remarks that, while he considers the number of bones in the human body to be 300, the adherents of Vedas hold them to be 360; and this is exactly the number counted by Caraka (Dasgupta, 1981: 278). It points to the fact that dissecting a cadaver was not a medical practice. So, anatomical pathology or the three-dimensional spatio-temporal mapping of the body was completely absent. As a result more emphasis was put on pharmacology or other subjects.

- (3) Caraka counts 14 bones in the breast, as Indian anatomists counted cartilages as new bones. While in Suśruta and Vāgbhaṭa I, the same curiously stands to be 8. The windpipe too is regarded as a bone (Dasgupta, 1981: 286).
- (4) In Indian medical texts, there are innumerable instances of misinterpretation of the anatomical terms through ages. One example – it is only as late as the sixth or seventh century AD that, owing to a misinterpretation of the anatomical terms *sandhi* and *aṃsa*, the windpipe or *grīvāḥ* (in the plural) appeared to mean clavicle (Dasgupta, 1981: 286). It strongly points to the question of absence of any standardization as well as uniformity of nomenclature and, in consequence, uniform understanding across different time and space. Latin or Greek terms used in Western anatomical descriptions could avoid such basic problems for scientific terms in international usage. Moreover, conscious efforts have been made to ensure uniform usage, particularly, since 1895 (*Gray's Anatomy*, 2000: 13).
- (5) Achieving a technique through repeated performances is not synonymous with acquisition of good anatomical knowledge. Excellence in nicely removing a cataract or performing a rhinoplasty does not automatically prove any sound knowledge of anatomy and morphology of the human body. Rather, it speaks of some knowledge about regional anatomy. The best example can be the case of Cowasjee's successful rhinoplasty by a brick-maker family of Puna (*Gentleman's Magazine* 24 October 1794). Manucci too mentioned of many cases of Indian rhinoplasty (Manucci, Vol II, 1907: 301). William Hunter's successful ligation of aneurysmal femoral artery – after innumerable experimental dissections – is not equivalent with the old Indian techniques of some specific surgeries for a few particular organs (Moore, 2005). Lacking the scientific basis of organ localization of diseases diagnosis of a disease was basically elucidation of prognostic features. The role of *karma* was an important issue

in this regard. To put it otherwise, anatomical and surgical practices were relegated to the hands of low-caste people. Scholarly medical practice without any surgical maneuver was traditionally pursued by high-caste Āyurvedics. One example, blood-letting, initially included in the practice of *pañcakarma*, was also purged from it (Zimmermann, 1989).

- (6) The validity of Āyurveda is due to the fact that of its being composed by trustworthy persons. (Dasgupta, 1981; 280) Even in later ‘modern’ reading of some of the medical treatises during 16th, 17th or 18th century it was not so much intended to question the authority of scriptures as to make these texts more comprehensible with changing time. During this period there came up many reinterpretations and dissenting voices like *Vīreśvara (Rogārogavāda)* of ancient texts (Wujastyk, 2005). But there was no rigorous study to delve into the body and its parts to gather new empirical facts. It would be more evident when compared to those of William Harvey or Richard Lower of the same period. Hence, no paradigmatic change in medical or anatomical knowledge occurred until British medical colleges set this into motion.

The first anatomical dissection was supposedly by Madhusudan Gupta (there are other accounts which contradict it). It was so phenomenal for the colonial project as to be greeted by 50-round gun salutes from Fort William. Dissection emerged as a potent method of producing and disseminating knowledge – a powerful technology for operating upon the human body. In dissecting the cadaver, the student penetrated, surveyed, and appropriated the interior of the body – and transformed himself. It is understandable that the existential nature of the body began to be substituted by a mechanistic model of the body.

But unlike England, in colonial India this ‘provincial’ education and knowledge production was distinctly different from ‘metropolitan’ knowledge. It was primarily intended to produce ‘capable practitioners’ instead of a mix of ‘capable enquirers and practitioners.’ While Western medicine in India was in essence the same medicine as that practiced in Europe at the same time and followed or participated in many of its critical developments, it would be mistake to imagine that it therefore lacked a distinctive identity and history of its own or that it was impervious to the physical, social, and political milieu in which it operated (Arnold, 1995). In those early years of anatomy education, only *Doms* would usually dissect for any Brāhmin or Baidya medical teacher. Students would learn passively. Western medical knowledge and anatomical education during that

period was perseverant to keep up caste and hierarchical social distinction in a secular, universal and scientific education system.

The ideological and intellectual crisis of the period is perhaps best illustrated in Western-educated *kavirāj* Gananāth Sen's book *Śārīr Paricay* (1924), written purportedly to resurrect old Āyurvedic knowledge of anatomy. On their behalf, Āyurvedics, following colonial medical encounters, were caught within a two-edged sword. First, since antiquity treatment of a disease could be efficiently resolved by the theoretical model of *tri-doṣa* theory and *marman*-s, without having any modern anatomical knowledge. Second, to establish Āyurveda as a valid and eternally 'modern' repository of knowledge, learning modern anatomy became mandatory for high caste Āyurvedics to usurp it from the lower-caste practitioners. Consequently, a shift from traditional philosophy of *tri-doṣa* theory to 'modern' notion of organ localization of disease occurred. It reconstituted the philosophical matrix of Āyurveda as well as Indian subjectivity too through this 'modernization' of Āyurvedic knowledge of anatomy.

In conclusion, it has been emphasized that during its formative period, Western medicine was fraught with tensions and contradictions, primarily, at three levels: (1) how to establish and legitimize authority and superiority of Western medicine (coming out of its 'enclave' origin) over indigenous ones; (2) how to ensure transmission of institutionalized European scientific medical education in 'native' language with this objective in mind; and (3) in which form to make it negotiable with the local cognitive world. But, after the introduction of anatomy as a separate and distinct discipline in medical curriculum everything changed in favour of modern education. A conceptual system of medicine ceases to be vital and creative when its major legitimizing circumstance, its particular context of social ideology and social structure, vanish, either in reality or in the aspirations of a population. Traditional Indian society followed the epistemological root – the legitimizing context – of Āyurveda.

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