

BOOK REVIEWS

Acharya Somadeva — *Rasendra Cūḍāmaṇi*, Hindi trans. Dr. Siddhinandan Mishra, Chowkambha Orientalia, Varanasi, Reprint 2009, pages: 332, Price: Rs. 275/-

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In the history of medicine in India, *Ayurveda* has the privilege of serving as one of the major health care systems for a longer period of time in Indian subcontinent. In the initial phase of emergence of *Ayurveda*, the drugs of herbal origin were predominantly used as documented in text from *Vedas* to *Bṛhatrayis* (Three major ancient classics of *Ayurveda*, namely *Caraka Saṃhitā*, *Suśruta Saṃhitā* and *Aṣṭāṅga Saṃgraha/Aṣṭāṅga Hṛdaya*), dating from 2500 BC to 700 AD. However there were number of contexts where many drugs of non-herbal origin like metals, minerals, gems and animal products have been used in this period also. The usage prevalence of non-herbal drugs along herbal drugs had eventually lead the origin of a special pharmaceutical wing of *Āyurveda* called *Rasaśāstra*, that flourished after 700 AD. *Rasaśāstra* uses metals, minerals, gems, drugs of animal origin and poisonous plants while mercury being the most common and important drug used for preparation of medicines. There are many documented literature written on *Rasaśāstra*, the major ones includes *Rasendra Mangala* (8th Cent AD), *Rasārṇava* (10th Century AD) *Rasa Hṛdaya Tantra* (12th Century AD), *Rasa Ratnākara* (12th Century AD), *Rasendra Cūḍāmaṇi* (12th -13th Century AD), *Rasa Prakāśa Sudhākara* (13th Century AD), *Rasa Ratna Samuccaya* (13th Century AD), *Rasendra Sāra Saṃgraha* (15th

Century AD), *Āyurveda Prakāśa* (17th Century AD) and *Rasa Taraṅgiṇī* (20th Century AD).

Rasendra Cūḍāmaṇi is one such written in Sanskrit during 12th – 13th Century AD by *Acharya Somadeva* who was the king of *Bhairavapuri*. Hindi translation with commentary of the book by Dr. Siddhinandana Mishra, published by Chowkambha Orientalia is available now.

There has been bifold variety of practices followed in the field of *Rasaśāstra*. The one, purely alchemical such as transmutation of laser metals into higher metals like gold and silver, technically termed to be *lohavedha* and the other iatro-chemical, preparation of therapeutic agents using alchemical drugs and procedures, termed to be *dehavedha*. Early texts of *Rasaśāstra* have concentrated on the former and while *Rasendra Cūḍāmaṇi* was one which emphasized both *lohavedha* and *dehavedha*. Thus it is a text of importance, witnessing the shift in the course of *Rasaśāstra* towards application in medicine.

The book comprises of 16 chapters having total of 1398 verses and covers topics like 18 different processings of mercury (*pārada saṃskāra*), varieties of mercury *bhasmas*, solidification of mercury (*pārada bandhas*), properties and actions of various *Rasaśāstra* drugs in the groups like *Mahārāsa* (Mica, Tormaline etc), *Uparāsa* (sulphur, red ochre etc), *Sadhārāna rāsa* (cowry, amber etc), metals and gems along with the method of purification and calcination. The book has given good definitions for the technical terms used in *Rasaśāstra* and detailed descriptions of various instruments (*yantra*), Crucible (*mūṣā*) and *Puṭa* (Quantum of heat) etc.

The first chapter is named as *Rasa mahima nīrūpaṇa* dealing with the importance of mercury.

Since mercury is core drug in the *Rasaśāstra*, the author has made elaborate description on its significance. Describing properties of mercury on combination with metals, it is quoted that on processing with gold, mercury will subside all the three *doṣas*; with silver, *pitta* disorders; with copper, *kapha* and *pitta* disorders; with iron, different kinds of abdominal pain; with lead, sour and blood disorders; with tin, diabetes mellitus and on processing with diamond, mercury will enhance the longevity of the individual. On processing with mica, mercury will loose its quivering. Later on he advises that instead of getting attracted by many kinds of medicines, one just need to follow *Rasaśādhies* which is best among them due to its capacity to act quickly in a smaller dose.

Titled as *Śiśyopanayanādi nirūpaṇa*, second chapter deals with the initiation process of the student. The author describes the qualities of ideal student and master for *Rasaśāstra*. Notably, along with other ethical aspects of qualities of student, the author claims financial richness as criteria for one becoming a *Rasaśāstra* student. This may be due to the fact that it needs lots of investment for one to buy *Rasaśāstra* drugs like mercury, different kinds of metals, and gems etc. Mercury is imported from other countries now, perhaps in even those period, hence the cost of the drug was possibly high even in those period. The book suggests to teach *Rasaśāstra* to all the four castes (*varṇa*). *Rasaśāstra* should be taught to *Brāhmins* for upholding the righteousness, to king and businessman for profession, and to all others for the purpose of service.

The third chapter is termed as *Rasaśālā nirūpaṇam*, deals with the construction of pharmacy. The chapter details the space division of pharmacy for various purposes of manufacturing process. Inside the *Rasaśālā*, statue of Lord of *Rasaśāstra*, *Rasa Bhairava* should be placed in the east; in the south west, processes involving the use of fire; in the south, processes

involving the use of poisonous drugs; in the south east, processes involving the cutting etc.; in the northwest, drying; in the north, transmutation of metals, in the north east, collection and preservation of final products and raw materials.

Fourth chapter titled as *Paribhāṣā nirūpaṇam* deals with technical terminologies. The chapter begins with incentives to the physician from the patient and drug dealer. These are called *Dhanvantara Bhāga* (Physician's part of medicines) and *rudra bhāga* (incentives from drug dealer). Other technical terms like black sulphide of mercury (*kajjali*), different alloys like *varaloha* (alloy of iron and stibnite), *varanāga* (alloy of iron and lead), *candrārka* (alloy of copper and silver), *piñjari* etc., plating out of gold and silver like *hemarakti*, and *tārakti* etc. different test for *bhasma* like *apurbhava* (irreversibility), *rekhāpūrṇa* (minuteness as to enter into grooves of fingures), *niruttha* (non-regainibility into original state) etc. have also been dealt in this chapter. *Niruttha* test using *tāmra patra* mentioned in this text is one of rare findings; other texts only mention the use of silver in this test.

Fifth chapter with the title *Yantra mūṣā koṣṭi puṭa nirūpaṇam* deals with 30 types of equipments (*yantra*), 17 types of crucibles (*mūṣā*), 4 types of furnaces (*koṣṭi*) and 10 types of puṭa (quantum of heat). Sixth chapter *Divyośadhi nirūpaṇam*, deals certain set of herbs which are termed to be *Divyauśadhies*, with their characteristics, which are useful for digestion of mica in mercury and to enhance the amalgamation capacity of mercury. Seventh chapter named as *Rasaśādhī nirūpaṇam* enumerates 68 herbs which are useful for the processing of mercury and are termed to be *Rasaśādhies* which is away from general implication of the word *rasauśadhies* meaning herbo-mineral preparations. Eighth chapter, *Sarpakṣyādi gana nirūpaṇa* deals with certain group of herbal medicines known as *Sarpakṣyādi* group of drugs which is useful in preparation of crucibles, boiling *saṃskāra* of

mercury and also purification of certain mineral drugs. Along with this certain other groups of drugs like *vyaghrikādi gaṇa*, *kadalyādi gaṇa*, *kākamachyādi gaṇa*, *vajra dandyādi varga* etc. Drugs under these groups are not clearly identified and many are not with the popular names found in other lexicons and treatises of Ayurveda.

Ninth chapter *Paribhāṣā nirūpaṇam* again another chapter on technical terms which deals certain other groups of terminologies such as sour group (*amla varga*), salt group (*lavaṇa varga*) and alkali group (*kṣāra varga*), poison group (*viṣa varga*), sub-poisons group (*upaviṣa varga*) etc.

Tenth chapter termed as *Mahārāsa nirūpaṇam* deals with the first category of *Rasaśāstra* drugs like (*abhraka*), ultramarine (*rājāvarta*), toumaline (*vaikrānta*), blue vitriol (*sasyaka*), iron pyrite (*vimala*), black Bitumen (*śilājatu*), copper sulphate (*tuttha*), and copper pyrite (*tāpya*). Inclusion of *rājāvarta* in *mahārāsa* and consideration of *tuttha* and *sasyaka* as two different drugs are unique in this text, though both are considered synonymous contemporarily. Another important observation is that *Rasaka* (zinc oxide) has not been included in the eight *mahārasas* enlisted in beginning of the chapter, but at the end of chapter the author explains about this drug in detail. However, though *tuttha* and *sasyaka* are separately enlisted in the beginning of chapter, separate explanations in terms of purification, extractions etc. are not found for them, only *sasyaka* is explained.

The chapter 11 named as *Uparāsa sadhāraṇa rasa nirūpaṇa* deals with two other set of eight drugs known as *uparasas* and *sadhāraṇa rasas*. *Uparasas* dealt with sulphur (*gandhaka*), red ochre (*gairika*), ferrous sulphate (*kāsīsa*), orpiment (*haratāla*), realgar (*manahśilā*), alum (*sphatika*), collyrium (*sauvīra*), and gamboge tree (*kankuṣṭa*). Eight *sadhāraṇa rasa* dealt are *Mallotus philippinensis* (*kampillaka*), arsenic trioxide (*gourīpācaṇa*), ammonium chloride

(*navasādara*), calcium carbonate (*kapardika*), ambar (*vahni jāra*), red oxide of mercury (*girisindhūra*), cinnabar (*himgula*) and litharge (*mriddara shrīṅga*).

The chapter 12, *Navaratna nirūpaṇam*, deals with nine gems, their purification, defects and therapeutic utility etc. The nine gems explained in the chapter are ruby (*māṇikyā*), pearl (*muktā*), coral (*pravāla*), emerald (*tārksya*), topaz (*puṣparāga*), diamond (*vidhura/vajra*), sapphire (*nīlā*), zircon (*gomeda*) and cat's eye (*vaidūrya*).

The chapter 13 *Navaratna rasāyana nirūpaṇa* deals with different rejuvenatory formulations of different gems like *māṇikyā rasāyana*, *mauktika rasāyana* and *pravāla rasāyana* etc. with their properties and actions.

Dhātu varṇanam, the 14th chapter, deals with nine metals such as gold, silver, copper, iron, lead, tin, brass, bronze, and bell metal. Properties, adverse effects of unpurified metals usage in therapeutic purposes, multiple incineration techniques (*bhaskāraṇa vidhi*) etc. have been elaborately dealt in this chapter. *Yaśada* (zinc) is not explained in this text which is used in *Rasaśāstra* in later period of time.

The chapter 15 titled as *Pāradotpatti saṃskārādi nirūpaṇam* deals with origin of mercury and other processings. The chapter covers different purification and incineration techniques of mercury along with potentization (*mukhīkaṇa*) of mercury. The last chapter titled as *Rasa jāraṇa nirūpaṇam* deals with digestion (*jāraṇa*) of different drugs like sulphur, mica, silver etc. in mercury have been dealt.

The book is considered to be one of the complete and authoritative books of *Rasaśāstra*, devoted to alchemy and iatro-chemistry with its originality. Important is the description of process by means of which *varanāga* is prepared from a mixture of *neelānjana* (stibnite) and *tikṣṇaloḥa* (iron). The verse shows that process by which antimony (*varanāga*) is obtained was known in

India much earlier than in Europe.¹ From the basic and therapeutic perspectives, *Rasendra Cūḍāmaṇi* has influenced significantly on later books of *Rasaśāstra* including *Rasa Ratna Samuccaya*, another classic written later in 13th century which is considered to be most authoritative classic of *Rasaśāstra*. The latter has taken matter *Rasendra Cūḍāmaṇi* along with original *ślokas* in several contexts especially in first to eleventh chapter. The book is unique to give number of alchemically important drugs of vegetable origin under four different categories like *Rasaūṣadhi*, *Mahaūṣadhi*, *Siddhaūṣadhi* and *Divyaūṣadhi* which are particularly suitable for solidification (*bandha*) of

mercury. The same has been taken in the latter important book *Rasa Prakāśa Sudhākara* as it is. In another context also *Rasendra Cūḍāmaṇi* has grouped many drugs under different categories like *Sarpakṣyādi gaṇa* and *Kadalyādi gaṇa* etc based on their use in different *saṃskāras* of mercury. An extensive description on the unique alchemical process called *Jāraṇa* (digestion of other drugs in mercury) is an important contribution of this book.

Reference

1. G. Jan Meulenbeld, A History of Indian Medical Literature, Vol II A. Egbert Forsten, Groningen, Netherlands. 1999.

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Martin Dinges (ed.)— *Medical Pluralism and Homeopathy in India and Germany (1810-2010): A Comparison of Practices*, Verlag Stuttgart, Stuttgart, 2014, Pages, 250.

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The book under review is a welcome addition to the ongoing debate of “medical pluralism”. Elegantly designed, neatly printed and without a single printing or typo-error, the book should be available to Indian readers. So far, it is available only in Euro-American world. Let us take a quick look into the contents and chapters of the book. The book contains thirteen chapters, besides a twenty three-page long Introduction by Dinges.

Beyond our all pro-active and counter-wishes, plurality of medical praxes does exist, hopefully, in every corner of the world. Plurality of medicine and its praxes are otherwise termed as medical pluralism.

This book came out of an international seminar of the same name. The conference theme was described in these words. Medical Pluralism is by now recognized as a reality in many countries. Studies, however, bringing together anthropologists and historians working on this subject are still rare. A comparative view on Germany and India with their different patterns of institutionalisation of medical pluralism is particularly rewarding. This volume focuses on practices starting with the story of a Transylvanian lay healer who functioned in Lahore as a cultural broker. Indigenising of homoeopathy in Bengal shows a particular mode of appropriation. Patients and their choices are considered for the late 19th and late 20th century Germany and in present day India. In addition to the practices of lay healers as health care providers in Bengal and in Indian slums, independent General Practitioners and physicians working in the public health care system are analysed too. A case study of an Indian hospital shows a pragmatic way to introduce medical pluralism into a modern “allopathic” institution. The political debate on

medical pluralism e.g. in the German Reichstag in the beginning of the 20th century is also one of the topics. The book concludes with a theoretical reflection on the concept of medical pluralism. The question of whether we face a “new medical pluralism” these days has been asked frequently. Undoubtedly, “biomedicine”, as the dominating modern medicine taught in universities and practiced by the majority of all physicians, is no longer – but was in fact never – alone in offering medical treatments to sick people. Amongst so-called “complementary and alternative medicines” (CAM) today, there are such different therapeutic methods as homoeopathy, naturopathy, ayurveda, yoga or traditional Chinese medicine. Since its foundation, research in the history of homoeopathy has been one of the main focuses of the Institute for the History of Medicine of the Robert Bosch Foundation in Stuttgart. For several years, this focus was broadened to the use and the history of “alternative” medical methods in general, dealing with questions concerning the “new medical pluralism” asked today and delivering a historical perspective to these questions. India is the country in which homoeopathy has received an amazing reception and developed a main role in the medical market. Since 1937, the therapeutic system, founded by the doctor Samuel Hahnemann at the beginning of the 19th Century, has even been one of the officially-accepted methods in India. In general, the tradition of medical pluralism is more evident there than in other Asian countries. Moreover, the official equality of “biomedicine” and the “other” therapies, ayurveda, yoga and naturopathy, unani, sidha and homoeopathy (AYUSH), is unique, giving medical pluralism in India a governmentally-supported basis. For all these reasons, a comparative perspective of India and Germany, specially focusing on homoeopathy, seemed very promising and therefore gave birth to the idea for this unrivalled conference. Scholars from very different disciplines were invited to Stuttgart to discuss the features of medical pluralism in those two countries.

Martin Dinges, the editor of this volume, has tried his best to accommodate as many papers and articles as possible to make the themed volume meaningful.

“Medical pluralism”, which was earlier expressed through various epithets like “plural medicine”, “synthetic medicine” etc., has of late gained currency among researchers, state policy makers, patients, media personnel and many more. Though, suffice to say, all have their own and unique philosophical position and differing niches of judgmental power. Some time ago Sarah Cant and Urshula Sharma discussed that pluralism in health care was nothing new. There had always been the possibility of choice between different kinds of practitioner, between consulting or self-prescribing, and there have always been multiple ways of understanding health and sickness. (Sarah Cant and Urshula Sharma, *A new medical pluralism? Alternative medicine, doctors, patients and the state*, Routledge, 1999). In the same book, they pointed to the fact that appeals to biomedicine’s superior knowledge base or epistemology no longer work as successfully as they did not least because of public dissatisfactions with biomedicine itself, which make new strategies now appear transparently self interested. (*A new medical pluralism?*, p. 186)

Earlier, about four decades ago, Charles Leslie took the lead to bring in Asian medical systems in stead of the biomedical system in his now famous edited volume *Asian Medical Systems: A Comparative Study* (Motilal Banarsidass, 1998, originally published in 1976). Leslie noted at that time, “Laymen consult these eclectic practitioners of traditional and modern therapies, and only in emergencies, risk the possible humiliation, the expense, and the other difficulties of gaining access to the fully trained practitioners of cosmopolitan medicine.” (p. 6)

It transpires from these analyses that first, the question of economic affordability; second, belief pattern of a particular society and social

psyche; and third, an endeavour to etch out one's identity through the act of so called "indigenization" or "hybridization" are some of the cardinal questions. All these topics and more have been taken into account in this volume. As an aside, Waltraud Ernst reminds us, "The language of pluralism still tends to reflect the very same static and discrete meanings and perceptions that many writers...aim to challenge and expose as products of restricted and restrictive imaginations and ideologies." (Waltraud Ernst, ed., *Plural Medicine, Tradition and Modernity, 1800-2000*, Routledge, 2002)

One more issue should be brought into our understanding. In the book, two countries – Germany and India – have been taken up as a case study. Interestingly, while Germany is a very developed industrialized country with a long history of scientific inventions, colonization and war, India has a long history of colonial subjugation and, presently, basking in the milieu of "post-colonial" development. Hence, the trajectory of the development and popularization of homeopathy must be differing in these two specific settings, with some strands of uniformity.

Dinges, in his Introduction, makes it clear, "A particular focus of this collection of essays is the specific position of homeopathy within the German and the Indian medical pluralisms." Moreover, as he observes, homeopathy came to be posited as an efficient mechanism to reform colonial domesticities – a remedy to cure the institution of 'family' from the corruptions inflicted by colonial rule on the pristine ways of Bengali life. He traces the pattern of growth of homeopathy vis-à-vis Ayurveda in India, as well as the interrelationship between the state and a medical system like homeopathy. He also raises questions about the role media play in the development of medical pluralism. He notes that there was a kind of Indian "nostrification" of homeopathy in Bengal.

Silvia Waisse in her "East Meets West" takes up the narrative of Johann Martin Honigberger, arguably, supposed to be introducing homeopathy in India. In so doing, she shows how up to the time of Honigberger growing up "doctors had a somewhat uncertain social position, becoming eventually marginalized and occupying the lowest socioeconomic levels." Importantly, she concludes that Honigberger looked down from the heights of European science to Muslim and Indian (not Hindu, but both Indian and Hindu equated!) doctors, and instead of discovering and learning Ayurveda he took recourse to the West to become initiated in homeopathy – a Western brand after all. Finally, she posits the lessons from Honigberger to our present era of globalization "where globalization threatens to do away with the innumerable differences that can only enrich human experience as a whole."

Shinjini Das in her paper, "Innovating Indegenity, Reforming Domesticity", tries to distinguish between homeopathy and the "state-imposed dominant medical practice commonly referred to as allopathy in Bengal." It may be worth remembering here, historically "allopathy" is a dislocated term for modern medicine or biomedicine. This dislocation has been made possible with the rise of homeopathy. According to Das, 'indegensation' and domestication' were two categories which were put into play to add an Indian hue to homeopathy. Das wants to relate homeopathy with a moral economy of the colonial Bengali family. "As distinct from the self-centred, Europe-inspired, individualized consumption," she argues, "the use of homeopathy signified an acceptable, desired, and indigenous form of consumption, compatible with the commitment towards a moral economy of family." She then proceeds to scrutinize various journals describing the uniqueness, cheapness as well as "supremacy" of homeopathy as contrasted with modern medicine, with regard to self-help and eventless cure. In an earlier research work, David Arnold

and Sumit Sarkar pointed out similar developments. To them, the progress of homeopathy “and its acceptance as an almost indigenous form of medicine close to the people” was also “bound up with its cheapness in terms of both fees and the cost of medicine”. (Arnold and Sarkar, “In search of rational remedies: Homeopathy in nineteenth-century Bengal”, in Waltraud Ernst, ed. *Plural Medicine, Tradition and Modernity, 1800-2000*)

One may ask if the absence of dissection and anatomical knowledge (which made modern medicine truly “modern” as well as loathsome at least to a section of Indian and Bengali society) and, unlike modern medicine, its less invasive nature did make homeopathy more acceptable and applicable? It may, I firmly believe, provide some clues to the issues of popularization of homeopathy in Bengal, as raised by Das – “despite the evident lack of institutional state patronage” and “as the ideal form of indigeneity in a colonial context.”

In the next chapter/paper – “Rethinking Asymmetries in the Marketplace: Medical Pluralism in Germany, 1869-1910” – by Avi Sharma, homeopathy is judged against a European country like Germany and, moreover, its interactions with marketplace. In Indian context, the emergence of a marketplace and vying for a chunk of share of profit as well as professionalism were not as poignant in India as in Europe. So, it is quite interesting to note in the paper, “In the process, doctors were drawn, first slowly, then more rapidly, into a competitive relationship with ‘other healers’.” Much earlier, Robert Southey, the poet, was much vociferous against quackery. He was also strongly in favour of professional registration of some sort. He noted in his *Letters*, “The *abracadabra* of the old heretics was lately in use as a charm for the ague, and probably still is where ague is to be found, for that disease has almost wholly disappeared within the last generation. For warts there are manifold charms.”

Further, he made a laconic observation, “Government gives an indirect sort of sanction to these worst of all impostors. They enter the receipt of their medicines as a discovery, and for the payment of about 100/. sterling, take out a privilege, which is here called a patent, prohibiting all other persons from compounding the same...” It becomes much evident that European scenario was tied in individual-cash-profit-state nexus, while in India it was primarily *sewa*-remuneration in kind-community bondage nexus which seemed to hinge around an intersubjective network. In his analysis, Avi Sharma points out asymmetries in market, which were never uniform, “this profoundly asymmetrical relationship has structural consequences.” These asymmetries finally reconstituted the discourse around the dominant “allopathic” and the emergent homeopathic healing processes.

Next chapter “A Homeopathic Clinic in a Multispeciality Hospital, Relection from Practice” by Ameeta R. Manchanda is a field study. In her interpretation, “Medical pluralism in health care signifies the provision of multiple systems of therapies for the promotion of health and prevention/cure of diseases.” Anybody should take it as an applied portrait of medical pluralism. It does not delve into any sociological or philosophical issues related to it. She draws our attention to some glaring facts. Out of pocket expenditure on health services in India is the highest in the world to the tune of 85%! Her applied approach becomes more focused when she emphasizes, “The controversial issues related to vaccination, use of two therapies simultaneously etc. should not be debated unnecessarily. The approach towards the patient should be practical and credible.”

The following chapter “Homeopathy in Urgan Primary Healthcare Units of the Delhi Government: An Assessment” by Raj Kumar Manchanda, Surender Kumar Verma, Leena V. Chhatre and Harleen Kaur takes up the issue

simply in a more elaborate and broader way as it is enunciated in the title. They use umpteen number of statistical charts, diagrams and figures to clinch their position. Finally, the paper turns to be a nicer statist version on homeopathy program – “the private sector needs to be involved so that the rising public demand for homeopathic services can be met. To achieve this, the PPP model should be adopted in a more evolved way...”

The longest as well as the most intriguing paper of this collection is from Harish Naraindas – “Nosopolitics. Epistemic Mangling and the Creolization of Contemporary Ayurveda” – spans 36 pages. He introduces some new and catchy terms like “modern doctors of traditional medicine (MDTM), epistemic mangling, Creolization etc. Scholars may argue that these are neologisms. Especially, regarding the first term, Jean Langford in his seminal work “Ayurvedic Interiors: Persons, Space, and Episteme in Three Medical Practices” (*Current Anthropology*, 1995, 10(3): 330-366) had dealt with this particular problem, though without coining the terminology. Langford noted, “Ayurvedic patients and practitioners strike a balance between accepting elements of competing medical systems and maintaining the distinctiveness of Ayurvedic insights and methods.” Unfortunately, Naraindas does not mention of this research work in his bibliography. He seems to insinuate between the chasm of epistemic and ontological universe. In doing so, he engages himself to explain “excising *Bhūta* and recruiting rationality”. One may wonder why he has explained Ayurvedic terms with the help of any current notebook on Ayurveda. It is also not understandable why in a so much thought-provoking rigorous essay he did not take recourse to Meulenbeld (*A History of Indian Medical Literature*, in 5 volumes), nor even Wujastyk for a proper explanation of Ayurvedic terms. He would find that scholarly explanation of these terms considerably vary from lay explanations which he has often employed. It becomes clearly evident in

his explanation of *śamana-cikitsā*. In the first place it is explained as “pacifying treatment”, while in the second place it is taken as “eliminating or eliminative treatment”. It is hard to cognize how the same term carries two different meanings in the same context. However, he notes, “There are two broad ways in which one can proceed with treatment in Ayurveda.” Langford addressed almost the same question from a different perspective. It may be benefitting to recapitulate, “Baudrillard asks (and, more importantly, deconstructs) whether a simulating patient who produces true symptoms is ill or not ... I ask whether a simulating doctor who produces true wellness is a doctor or a quack. Just as simulated illness tends to erode the distinction between true and false illness, so it is argued here that simulated cure tends to erode the distinction between true and false medicine” (Medical nemesis: healing signs of a cosmopolitan ‘quack’”, *American Ethnologist*, 1999, 26 (1): 24-46.). In his paper too Naraindas appears to deal with a similar set of problems. He strongly argues for a new and harsh coinage “epistemic mangling”. Scholars have so far dealt with this issue by employing the more modest concept of “hybridity”. In Spivak’s analysis, there remains “the always asymmetrical relationship between the interpretation and transformation of the world” (“Subaltern Studies: Deconstructing Historiography”, in *Subaltern Studies*, IV, ed. Ranajit Guha). It can be argued that there is an asymmetrically overdetermined space where different healing traditions and paradigms talk to one another. Here the tilt remains towards the dominant and hegemonic discourse – biomedical discourse, in our discussion. Naraindas wishes to problematize other discourses like Ayurveda through the window of these asymmetries and recreate a narrative of the less dominant discourse where “production of a Creole” materializes the sustenance of this discourse. He traces the trajectory of Creolization through this process of mangling. Importantly, he notices that “the two systems, Ayurvedic and

biomedical, are being mangled rather than the practitioner simply switching back and forth between two conceptual systems..." Coming to homeopathy, he finds that "homeopathic nosology may be read as a medico-social commentary of allopathy". The author explains how the word creolization has been employed. While it can easily "subsume these processes within itself, points to the emergence, at least at this historical juncture, of a new lexicon and a therapeutic protocol under conditions of unequal contest marked initially by colonialism, rather than a mere continuation of Ayurveda with twists." With some distancing, one may take these arguments and reasonings to think from a different perspective.

Let us now proceed to the next chapter "The Quest for Another Recognition. Ethnography of an homeopath in Tamil Nadu" by Hugues Dusausoit. He wants to trace the question "why India, more than any other country, is today so receptive to homeopathy." In his field study, he traces the answer through the quotidian routine of the homeopathic practitioner. His interviewee stresses that "homeopathy should copy the biomedical approach." The author provides us a simple answer to solve the riddle why India is so much receptive to homeopathy – "Perhaps it is not so improbable that part of the success of homeopathy in India can be explained by the fact that to study homeopathy there is an easier and a faster way to become a doctor than to study medicine." Even if it is true it is too simplistic an answer to appeal to a scholarly mind.

Marion Baschin – "The Patient's Choice – How and Why Sick People Used Homeopathy in 19th Century Münster" – notes that finding out why people used homeopathy in the past is not much easy. In author's finding, the majority of the sick people in Münster visiting homeopath doctors in the period mentioned had had the experience of "allopathic" medicine "either by self-medication or under the guidance of an approved medical person." As a result, they cannot be

counted as "loyal" users of homeopathy at the time when they start their treatment. Finally, "Most sick people "shopped around" searching for a cure, whatever it might have been. In view of this result, homeopathy cannot be regarded as an "alternative" in the medical market of Münster, but more as a "complimentary" offer." It appears to be a more convincing as well as modest answer for the growing homeopathic practice, when contrasted vis-à-vis biomedicine.

The following article – "Patients' Trend in Choosing the Homeopathic Medical System in India" – by Rahul Tewari and Ramachandra Valavan succinctly puts, "India knowingly or unknowingly follows pluralism in healthcare." They inform us that with 2,30,000 homeopaths India is presently estimated to have the largest number compared to any other country. Along with this homeopathic industry is growing faster than the mainstream medical industry, at around 25%, whereas the conventional system of medicine is reported to be growing at a rate 8-9%. As an important note, as their research reveals, "Around 30% of people seeking homeopathy have a poor economic background and only 13% are from the middle or upper class." It is a pointer to the question why homeopathy is well received in India where economic disparity is so flagrant.

The next chapter by Philipp Eisele ("Medical Pluralism and the Patients' Perspective in Germany – Letters to "Natur und Medizin", 1992-2000) draws our attention to the fissure of the dominant biomedical practice. In his view, "Although Biomedicine still dominates the medical market, its hegemonic position is challenged and questioned by various therapeutic systems which have their own concepts of health, illness and healing." Not only in this paper almost all the papers in this volume locates the question of healing traditions, therapeutic paradigms and their vitality in relation to market forces. Possibly, I am afraid, it is the biggest lacuna of this important monograph. Unfortunately, sans Naraindas, none

has tried to assay the strength of homeopathy or Ayurveda in their own rights. Moreover, as the author of this paper argues, “One serious reason that made the patients turn to CAM could be found in the negative experiences they had with BM (Biomedicine) therapies and therapists.”

In her paper “Medical Pluralism in a Slum in Delhi: Global Medicine in a Local Garb”, Nupur Barua clearly states, “The burgeoning 80 million urban poor in India struggle for basic services like housing, water and sanitation.” She unfailingly notes that there remains a strong link between these contextual forces and the striking differentials in health and health care among urban poor and non-poor groups. She finds some “kind of treatment cocktail seemed to sit well with the patients.” At this juncture, she rightly distinguishes between “patients’ interests in, and the decision to seek, traditional or alternative systems of medicine – most notably Ayurveda and homeopathy” in European and Indian contexts. While in Euro-American world it is a kind of revolt against “dehumanized” modern medicine and “biomedicalization” of every aspect of life, in Indian context, the paucity of resources which compel most of the poor people to take resort to the so called CAM. She tells us, “The pluralism that one witnesses must be understood, therefore, in the context of one of the most densely populated and compromised population groups for whom the main imperative is to return to work as quickly as possible, driven as they are by the crippling insecurities of income and tenure.”

Krishna Soman, in her penultimate paper – “Pluralism, Popularity and Propaganda: Narratives of Lay Practices of Homeopathy in India” – addresses the question of medical pluralism anew, “Such pluralism, however, revolves around a dialectic core of healer and patient in multiple spheres of the health care system.” It seems to be plural rather than pluralistic in nature. Then she takes up the issue of AYUSH in Indian specificity. She also provides relevant

data. In her trenchant note, “The process of professionalization (of modern medicine during the 19th century) was uneven and marked by conflicts with the rival allopathic system which finally led to a relationship of antagonism. It also placed homeopathy in a position subservient to allopathy”. Such subservience becomes glaring when we think of the practices in Tagore family or of Vidyasagar. In the latter case, Vidyasagar, being initiated into homeopathy by Mahendralal Sarkar, tried this medicine primarily for poor Santals of Karmatar (Indra Mitra, *Karunasagar Vidyasagar*, Calcutta, Ananda, 2006). Soman traces the evolution of Homeopathy from the period of Dr. Honigberger to Dr. Mahendralal Sarkar, with a particular focus on Tagore family. It may be quite useful for readers to know how homeopathy was received and practiced within the enclave of Tagore family, including Rabindranath Tagore himself at the helm. She possibly misses to cite references while talking about a French doctor, C. Fabre Tonnerre, serving as the superintendent medical officer of the short-lived Calcutta Native Homeopathic Hospital in 1852. It may be interesting to cite here the contrast between Rajendralal Dutta, an advocate of homeopathy, and Radhakanta Dev, a strong advocate of modern medicine introduced by the British in India. She then deftly narrates the story of Chatterjee family doing homeopathy practice in Birbhum, a district of West Bengal, India. Soman is a descendant of this family. Hence it can be taken as a first hand account of homeopathy practice over generations with all its uniqueness in a part of West Bengal. She informs us that at independence, lay practitioners of homeopathy in India were 40 to 60 times higher than that of the qualified homeopathic practitioners. “Lay practices of homeopathy have gone beyond the family to conquer the confidence of the communities at large.” She also provides some accounts of different homeopathic institutions and pharmaceutical companies, along with their present state of struggling existence. After her long

analysis, she questions with some uncertainty, “Can one make a comment that in the social ambience of ‘plurality’, the relationship between the two systems of medicine is one of tolerance as opposed to the antagonism that persisted for a long time?” To mitigate the problem of unqualified service in social world of decrepit medical services, “regulation emerges as an important issue”, as she argues, “in the provision of quality health care to the rural population, particularly the socio-economically marginalized.” Following Arthur Kleinman, she traces how a concept and practice of self-help emerges amongst population living amidst uncertainty and dangers of various kinds.

In his concluding paper – “Looking Behind and Ahead” – William Sax remarks, “The lessons of this volume are therefore both negative and positive.” On the negative side, these essays make it clear that we should not assume (or, we should no longer automatically assume) that medical pluralism is a special feature of non-Western societies, nor that it disappears with the emergence of biomedicine. On the positive side, we can assume that medical pluralism is the standard human condition, that medical systems may sometimes be in relations of competition and even hostility; and that they are often quite fluid and adaptable. He hopes that taking both these aspects into account future research on this topic may have its future guidance.

We should be aware of dissenting notes too. Neshat Quaiser, while dealing with Unani in

particular, warns us, “otherwise purely secular dimensions such as state policy, modernity, market, competition, professional rivalry, the modern manufactory, etc. have acquired communal connotations which have constituted a serious impediment to the growth of Unani as a distinct system of medical knowledge; to its contribution to the general health care system; and its emergence as a CAM” (*Medical Pluralism in Contemporary India*, ed. V. Sujatha and Leena Abraham, Delhi, Orient Black Swan, 2012). It does become a serious flaw to ponder over. Otherwise, medical pluralism for which this discussion is intended would be outwitted.

Another important issue remains to be resolved. In this gamut of discussion, mental health has been completely ignored or remains unheard of. Fabrega, while talking about Ayurveda, argues, “while not strictly involved in the business of curative medicine, nevertheless had a profound influence on mental health and practice” (Horacio Fabrega Jr., *History of Mental Illness in India: A Cultural Psychiatric Retrospective*, Delhi, Motilal Bnarsidass, 2009).

Moreover, it becomes more relevant because of the fact that modern medicine deals with a patient, a conglomeration of pathology inside the body, not the person per se. Contrarily, homeopathy or Ayurveda is supposed to deal with a whole person, with both psyche and *soma*. Addition of any discussion on mental health would render the volume more valuable and useful.

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Jahnvi Phalkey — *Atomic State: Big Science in Twentieth-Century India*, Permanent Black, Rani Khet, India

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This book by Jahnvi Phalkey tells an absorbing tale of three cities – Bangalore, Calcutta and Bombay – of physicists and institutions in them, and their competing efforts from the late 1930's onwards to initiate research, teaching and training in nuclear physics in India. It was a tumultuous period in Indian and world history, as much as in physics. Nuclear fission had just been discovered. The steps towards India's independence and planning for the future were gathering strength. Soon the Second World War would engulf the world. Towards its end the atom bombs dropped on Hiroshima and Nagasaki in August 1945 demonstrated the awesome power of nuclear weapons, and also how close politics and science had come to one another, on a scale never seen before. After this, the link between nuclear research and politics, weapons and war became inevitable.

To see these events in perspective, it helps to describe briefly the development of the subject of nuclear physics during the decade of the 1930's. The nucleus, the massive central core of the atom, had been discovered much earlier by Ernest Rutherford in 1911. In his atom model, electrons orbited the nucleus but at very great distances, much like planets in the solar system. Subsequent developments – Niels Bohr's 1913 theory of atomic structure and spectral lines, the Old Quantum Theory pursued up to 1922–23, and then the discovery of quantum mechanics proper in the brief period 1925–1927 – were concerned largely with the physics of electrons and radiation. In this

process the proper theoretical foundations for chemistry and spectroscopy were created.

In 1917 Rutherford had demonstrated the transmutation of the nucleus of nitrogen to that of oxygen, when bombarded by helium nuclei. Initially it was believed that all nuclei are made up of protons, the nucleus of hydrogen. Then James Chadwick's 1932 discovery of the neutron, as a constituent of atomic nuclei beyond hydrogen, inaugurated the field of nuclear physics proper. It must be recalled here that Bohr had realized much earlier that all three forms of radioactivity are nuclear processes, having nothing to do with the shells of electrons in atoms. Though it was not initially clear, later developments showed that the principles of quantum mechanics were valid at the nuclear as much as at the atomic level.

Soon after 1932, the subject advanced rapidly. On the theoretical front, important ideas came from Werner Heisenberg, Eugene Wigner and Ettore Majorana among others. On the experimental side, in the mid 1930's Enrico Fermi and his group in Rome showed that irradiation of atomic nuclei by slow neutrons produced new radioactive species. Then in 1939 Otto Hahn and Fritz Strassmann in Germany made the startling discovery of nuclear fission: again upon irradiation by neutrons, nuclei of uranium split into fragments of comparable sizes, accompanied by release of more neutrons and tremendous amounts of energy. That this nuclear fission process could be a source of energy on a hitherto undreamt of scale was realized quickly by Fermi, Bohr, Wigner and others. This realization led to many historic events connected with the Second World War: the August 1939 letter from Albert Einstein to President Roosevelt of the USA alerting him to the possibility of a nuclear bomb, the setting up soon after of the Manhattan project under Julius Robert Oppenheimer's leadership to develop the bomb,

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and the actual attack on Hiroshima and Nagasaki on August 6th and 9th, 1945.

In passing it may be mentioned that 'atomic energy' and 'atom bombs' are both misnomers; the correct phrases are 'nuclear energy' and 'nuclear bombs'.

Thus during the 1930's nuclear physics emerged as an important frontier of physics. The study of cosmic rays, and the development of the technology of cyclotrons led by Ernest O. Lawrence at Berkeley in the USA, were the other major areas at the frontiers of physics at that time.

It was against this background that in 1938 Chandrasekhara Venkata Raman at the Indian Institute of Science (IISc) in Bangalore, and Meghnad Saha at the University Science College in Calcutta, independently felt that for the progress of physics in India the subject of nuclear physics had to be introduced in our institutions. Saha, Satyendra Nath Bose and Raman were the three stalwarts of Indian physics in the 1920's. Their achievements in 1920, 1924 and 1928 respectively had placed Indian physics at the forefront of the subject worldwide, with Raman receiving the 1930 Nobel Prize. Raman and Saha were three years apart in age, and relations between them had been difficult from the time that Raman had been in Calcutta. Apart from this, Raman had faced difficulties at the IISc to which he had moved from Calcutta as Director in 1933. By 1937 he had been forced to step down from Directorship, but he continued as the Professor of Physics till retirement in 1948.

At that time in India some areas of science were covered by National Surveys set up by the British – these included Botany, Zoology and Geology. However subjects like physics, chemistry and mathematics were cultivated mainly in a few university departments and research centers. Among the better known places were the IISc; the Indian Association for the Cultivation of Science (IACS) in Calcutta where Raman worked

from 1907 to 1933; the University of Calcutta from where Raman moved to Bangalore in 1933; and the University of Allahabad where Saha had been Professor from 1923 to 1938 before returning to Calcutta.

Both Raman and Saha had research and training of students in mind in their proposed plans. Raman sent his student R. S. Krishnan to the Cavendish Laboratory in Cambridge in 1938 to be specifically trained in nuclear physics. Krishnan completed his Ph D in 1941 and returned to India, to try and carry forward Raman's plans. Similarly, Saha sent his student B. D. Nagchaudhuri in 1938 to Berkeley to be trained directly by the cyclotron pioneer Lawrence. Nagchaudhuri completed his Ph D in 1940, and then headed back to work with Saha on his project.

Meanwhile it was becoming clear in the West that the demands of the subject of nuclear physics were so great that individual universities could not afford to accommodate such programmes on their own. A few medium to large size universities in the US did run cyclotrons on their campuses, but they soon shifted to a collective mode of functioning. For example, the Brookhaven National Laboratory was set up in 1947 as a joint venture of several universities in the region. The atomic energy research establishment at Harwell in the UK was similar.

The two other important persons in Phalkey's book are Homi Jehangir Bhabha and Shanti Swarup Bhatnagar. Bhabha was about twenty years younger than Raman and Saha, and had been trained in Cambridge in the early 1930's in the modern areas opened up by quantum mechanics. He had done outstanding work on the theoretical analysis of cosmic ray phenomena, and was very familiar with the leading physicists and institutions of that period in Europe. While visiting India on holiday in 1939, the war broke out and he could not return to Europe. He had family connections in Bangalore going back a couple of

generations. Raman offered him a position as Reader in Theoretical Physics at the IISc in November 1939, elevated to a Professorship in 1942. During the Bangalore period, Bhabha conceived of a new research institute in India similar to those he had been at in Europe. With help from the Tatas, in mid 1945 the Tata Institute of Fundamental Research (TIFR) was formally established, first within the IISc, and six months later moved to Bombay.

Soon after, the Atomic Energy Research Committee (AERC) was set up in May 1946, functioning within the Council of Scientific and Industrial Research (CSIR) and with Bhabha as Chairman. In 1948 this was changed to the Atomic Energy Commission of India (AECI). The Department of Atomic Energy (DAE) came into being in 1954. By this time Bhabha had become the acknowledged spokesman and leader for all efforts in the area of nuclear physics in India.

Bhatnagar on the other hand was a chemist who was chosen to head the CSIR set up in 1942 as part of the war effort. In the period just before and immediately after Independence, the closest advisers to Nehru on science policy matters were Bhatnagar, K. S. Krishnan and Bhabha. Even though Saha had been a part of the planning process in preparation for Independence, he was not a member of this circle around Nehru.

With this much background, Phalkey's book and its aims are easily appreciated. The two opening chapters describe science, more particularly physics, in India under British rule, as well as the growth of an Indian scientific community, and discussions on the way in which scientific research supported by Government should be organized post Independence. The times were difficult, and people, institutions and resources were limited. This part of the book is of course not limited to nuclear physics. The next three chapters are devoted in turn to Raman's proposal to start nuclear physics activity at the IISc, Saha's proposal to do so and to build a

cyclotron in Calcutta, and the (slightly later) establishment by Bhabha of the TIFR in Bombay, leading on to a full fledged programme of atomic energy research in the country also centered in Bombay. As mentioned earlier, the general consensus developing world wide at that time was to create centralized shared laboratories for nuclear physics type activities, collectively 'owned' by several universities. In retrospect it seems this path was unavoidable in India too.

The Bangalore effort continued till 1947, when it was finally given up. Krishnan prepared and presented plans on three separate occasions – 1942, 1945 and 1947 – to start nuclear physics research and training at the IISc, but could not succeed. Possible sharing of facilities among IISc departments was also considered. It is relevant to remember that Krishnan went to Cambridge just before Bhabha came to Bangalore; by that time institutions in the US were going beyond the Cavendish (already depleted due to the war) in nuclear physics. After his return to Bangalore, Krishnan and Raman and Bhabha overlapped at the IISc for some years. The final 'fatal' report on the Krishnan proposal was written by Bhabha and H. J. Taylor of Wilson College in Bombay. Even though the Raman–Krishnan proposal was quite modest compared to the Calcutta proposal and the efforts in Bombay, the report viewed it as not in consonance with national level policies for nuclear physics research. At one point Raman wrote to the Government of India complaining that the AERC wanted to 'create a monopoly in the subject for certain favoured laboratories and individuals to the exclusion of others'. All these events are described and analysed in great detail by Phalkey. Bhabha even invited Krishnan to move to TIFR and pursue his ideas there, but Krishnan declined. He succeeded Raman as head of the IISc Department in 1948, and switched to other areas of research.

The story of the Calcutta effort is somewhat more complex. Saha was in close

contact with Lawrence for a long time, and sought his help and advice on many matters. He was involved earlier with the national planning effort, and later was Member of Parliament. He and Nagchaudhuri introduced teaching of nuclear physics in Calcutta, and after many years of struggle built a cyclotron in 1954. Along the way Saha saw the need to move nuclear physics activity outside the university, and founded the Institute of Nuclear Physics in 1948. (This was renamed later as the Saha Institute of Nuclear Physics). There were several occasions when problems arose with Bhabha and the AEC. It comes as a surprise to read that for practical travel related reasons Saha could not attend many critical meetings convened by Bhabha. In important ways it turned out that Bhabha was more practical minded than Saha. On one occasion Saha wrote a very bitter letter to Nehru recalling their association since 1936, and then complaining against his being ignored. There was even an episode which can be viewed as Bhabha 'snubbing' Saha and his group. Finally, in the end, where the Bangalore effort failed, the one at Calcutta succeeded at least partially. As Phalkey says in a footnote, 'the laboratory in Calcutta... was the only laboratory for nuclear physics that survived the struggle against centralization and grew steadily in importance...'

The chapter on the TIFR and the emergence of the atomic energy programme and establishment is interesting for its own reasons. Bhabha was indeed very close to Nehru, who supported him in all his major plans. In 1946 the TIFR was named an institution 'of national importance' by the AERC. Bhabha simultaneously led the TIFR – the 'cradle of the atomic energy

programme' – as a centre dedicated to pure research, and the Atomic Energy Establishment (AEE) as a mission oriented organization. In Mark Oliphant's words, he built one around individuals and the other around tasks. Even so, there were ambiguities in the relationship, leading to difficult situations and decisions involving the two. Even within the TIFR, we read, there were changes of policy and directions which seemed unavoidable but led to some bitterness. It is a tragedy that Bhabha died in an air crash in 1966, when he was not yet 57; one feels somehow sure that he would have handled these 'problems', and continued to provide leadership, imaginatively.

To sum up, Phalkey has written a very well researched book on the emergence of nuclear physics as a research field in India during a crucial phase of our history. There are numerous footnotes and references in each chapter rounding out an absorbing account. It seems that no other area in science – neither chemistry nor biology – lends itself to such a study and all the lessons it teaches us. In a way this book reminds us of Constance Reid's acclaimed biography of David Hilbert, in that Reid was not a professional mathematician and yet wrote so well.

This account may well lead us to revise our views of several leading figures in our science in the past. Many decades have passed since those times, so we should view individuals and events dispassionately. It will be of enormous interest to all those associated with or working in the IISc, SINP, TIFR, DAE and CSIR today, not to speak of the wider scientific community of the country. We should not ignore history, but we should not feel trapped by it. We need to learn from it and move on.