

**Tradition and Innovation in the
Ayurvedic Medical System of India:
Looking beyond the 'Paradigm Dispute'**

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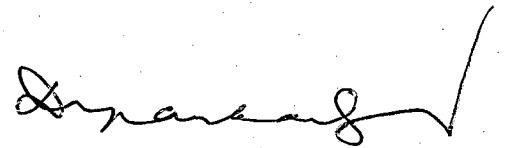
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CERTIFICATE

This is to certify that the dissertation entitled "Tradition and Innovation in the Ayurvedic Medical System of India: Looking beyond the 'Paradigm Dispute'" submitted by Ms. Ritika Ganguly in partial fulfillment of the requirements for the award of the degree of Master of Philosophy of this University, has not been previously submitted for the reward of any degree to this or any other University. This is a bonafide work.

We recommend this dissertation to be placed before the examiners for evaluation.


Tiplut Nongbri
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(Supervisor)

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Chapter One

The Medically Pluralist Experience of Ayurveda: Problematizing it

Traditional medicine has played a much more significant role in the construction of modernity than has generally been recognized. The methods and theoretical perspectives used in interpreting *medical pluralism* in India have somewhat delimited the scope of the discourse in traditional medicine, particularly Ayurveda, and assigned it a subaltern role in discussions on the relation between medicine and social theory. The research that I propose to undertake is a case study of how the professionalization of a scientific community¹ enables us to observe the emergent 'modern' character of the parallel operation of two independent medical systems in a medically pluralist society like India, and my interest in this area derives primarily from two observations – one, that the inclusion of modern science models in Ayurvedic research helps, rather than impedes the development of medical knowledge in Ayurveda; and two, that intellectual experimentation in the field of medicine in India today, that is based on the use of distinctive medical traditions for the purpose of scientific inquiry into medicine, has the capacity to create a new discursive space for the interaction between the Ayurvedic and western systems of medicine.

Framing the Problem

Sociological and anthropological works on Ayurvedic medical science, like any other branch of knowledge, have tended to develop their own set of assumptions. Studies in the social history of Ayurvedic medicine have regularly invoked the nationalistic, spiritualistic, and revivalistic element of this medical tradition to justify its existence. It is these elements that, taken together with the 'antiquity' of Ayurveda, that are sometimes taken to constitute the critique of the bio-reductionism of western medicine². Any discussion of

¹ I have taken the Ayurvedic scientific community as my case, and I have restricted myself to the 'research' aspect of Ayurvedic medicine, excluding practitioners and doctors from my analysis because, important as they are to the community of Ayurvedic scientists, to ascertain the nature of their interaction with other medical systems would require primary level data collection, which was outside the scope of my thesis.

² This is one of the most striking characteristics of the Ayurvedic resistance to western medicine in post-colonial literature in India. Everytime the question of challenging the dominant bio-medically oriented system is raised, instead of contrasting and comparing the medical qualities and advantages of using the Ayurvedic system of medicine over western medicine, the 'Indianness' of the tradition is highlighted. And this, I want to emphasize, is quite different from the points that make up the holistic critique of the bio-reductionism of western medicine.

Ayurveda in post-colonial India assumes the presence of allopathy, where the latter is viewed as an entrenched and hostile force, but that nevertheless, is the 'other' that helps Ayurveda in constructing its own identity. If western medicine is mainstream, then Ayurvedic medicine identifies itself as an 'alternative' to the mainstream and, therefore, to all its ways of doing something about sickness.. But it should be pointed out at the outset that like 'traditional', 'alternative' implies a residual definition, the risks of which, as an analytical tool, have been discussed in detail by some writers. (Wardwell, 1994; 1061)³. Ayurvedic practitioners do not fall under the rubric 'alternative healers', while there are health professionals who clearly do⁴. Also, alternative 'to what' is a question worth asking, because the generic use of the term to denote Ayurveda could end up meaning implicitly that it is an alternative to scientific medical practice itself. As a widely practiced healing modality across India, Ayurveda is a scientific and organized system of medicine that cannot residually and simplistically be referred to as alternative⁵ because it has a precise description, with elements that are typical to it, and that are not ascribable to any other system of medicine. 'Alternatives' do not usually possess this element, and they generally refer to a catch-all category inclusive of whatever is left after the orthodox and 'regular profession' has defined its role and function.

This sort of an understanding serves to normalize the practice of *signification*, that has been understood to mean an intellectual setting of boundaries that provides identity for oneself by constructing the other as an inverse image of oneself, thus giving legitimacy to

³ Commenting on the state of alternative medicine in the United States, the author holds that residual definitions, for instance, the definition of 'health' as the 'absence of disease' is seldom satisfactory. Especially unsatisfactory are the many definitions that are historically used to describe health practitioners who are "other than orthodox", generally, simplistically and residually, as 'unorthodox' practitioners.

⁴ For instance, marginal and quasi-professionals like osteopaths and naturopaths, and healers who rely almost wholly on dietary changes.

⁵ Though officially in India, Ayurveda, for all practical purposes is *traditional* medicine, it is important to dissociate it from the 'alternative' label because contemporary scholarship in the US includes Ayurveda under the blanket term 'Complementary and Alternative Medicine' (CAM), thereby giving it a place with chiropractic, osteopathic, water cure treatment, divine healing, faith healing, contemporary folk medicine and even quackery. (With so many varieties of healing denoted by term 'alternative', I think that the term itself is of questionable value). The risk in such an endeavour – in addition to remaining oblivious to understanding the ways in which Ayurveda qualifies as a scientific, medical system that cures by means of drug intervention – is that there is considerable give and take of such defining terms in the academia. It is necessary, therefore, to

the idea of dichotomous medical knowledges. In our effort to understand the deployment of symbols and metaphors, we must recognize the fact that one of the most powerful ways of using them in our culture has been in the form of these dichotomies, where two opposed terms mutually define each other (Samson, 1999; 37)⁶. While one bases its multifactorial etiology on the interdependent and interconnected mind - body - spirit complex, the other assumes the mind-body dualism and the doctrine of specific etiology. While one is a 'moral' and spiritual enterprise that respects the body, the other is a dehumanizing⁷ and undemocratic means of intervening for the purpose of correcting what may go wrong with the body. While one system of medicine explains, attributes meanings to, and manages life, culture and death, the other just cures.

This has an interesting corollary. Amidst a diversity of themes in medical sociology that have understood the body as a metaphor of society, the centrality of western medicine to participate in the broader debates of 21st century social theory is evident. In late modernist readings of contemporary social life as a reflexive order (Giddens, 1991), 'modern' medicine has played a very significant role in articulating debates. Debates, for instance, that address the consequences of modernity that are only now becoming fully realized or those in which the 'self' remains a pertinent theme, regularly find it useful to employ the theme of medicine. In an increasingly "mediated" and "contested" age, the body too becomes a contested site upon which the broader dramas of contemporary social theory

clarify at this stage that what is 'traditional' in one context is not necessarily 'alternative' in it, despite both being outside the sphere of 'regular medicine', which is often 'modern'.

⁶ The author has contributed a paper titled "Natural Facts: A Historical Perspective on Science and Sexuality" to a collection of essays in *Health Studies : A Cultural Perspective*. Though she raises this point in order to provide a perspective on science and sexuality, I have found her description of "distinction between men as cultural and women as natural" useful, analogous and closely related to an issue that my thesis addresses.

⁷ Foucault's entire medicalization critique rests on this idea. The 20th century mode of perception of medicine made the project of seeking medical attention removed from one's knowledge about one's own body, and for the first time, vested complete charge of the patient in the clinic and other 'dehumanized' means of social control of the individual body. My point of citing this here is that a lot of studies in Indian medical sociology have proceeded on similar lines of categorizing one type of medical system by critiquing the western medical paradigm and constructing an ideal type of a medical system *opposed* to the former, that cures without the package of ills that the western medical profession comes with. The professional autonomy that the medical profession has in exercising controls over the form and extent of treatment, they describe, virtually eliminates the freedom of choice of the individual. Works such as these forget, as I shall discuss in some detail in my third chapter, that western medicine has accommodated the individuality of the individual patient more fully than has Ayurvedic practice.

are played out. The recent upsurge of interest in body matters within the academy, the growth of social reflexivity, the postmodern attack on the disembodied Cartesian rational actor, and the proliferation of new technologies designed to control and (re)shape (J Williams, 1997; 1041)⁸, have all suggested that there is a division of labour, as it were, in mediating the relationship between medicine and social theory. While discourse in modern medicine⁹ revolves largely around ethical qualms, moral dilemmas, questions of self-identity, and the 'risks' of moving into an era of fabrication, themes that capture the sociological imagination for Ayurveda still largely consist of questions of survival. Even in sociological accounts which interpret western medicine's organization as, first and foremost, a modernist enterprise, steeped in a scientific tradition of truth, order and progress, the broader set of theoretical debates that have engaged Ayurveda are organized around the nationalistic, patriotic and revivalistic impulse.

In responding to this tendency, which marks Ayurveda as irrevocably *other* and subaltern to the agents of modernity, I propose to provide an alternative analysis of how a traditional science may be actively included in discussions of modernity, without necessarily invoking its ancient, traditional, spiritual and revivalistic character that has hitherto served as the potent 'dark side' against which modernity takes shape and measures itself.

Medical Pluralism and the Ayurvedic 'Revival'

Medical pluralism has been a topic of several essays and research studies in medical sociology and anthropology. In practice, it implies the co-existence of more than one system of medical care in a particular society, the relationship among which may run through a variety of ranges between the 'collaboration and combination' and 'parallel

⁸ According to Simon J Williams, who has tried to reconsider the role of medical technology in rendering our bodies "uncertain" at the turn of the century, explains that, from plastic surgery to virtual medicine, medical advances have developed and extended the "rationalization" of the body in ways that reflect the crisis of meaning in 20th Century.

⁹ This 'discourse' has been given impetus, in large part, by researches in gene therapy, advances in technological sophistication and developments in screening technologies and that has created new areas of debate in modern medicine in particular, but around the *meaning* of life in the 21st Century, in general.

independent types' (Young, 1994). Ayurveda's modernization in such a medically pluralist scenario, has often, sociologically and anthropologically, been understood as an analogy for the 'syncretic' character of India. As a concept, syncretism's significance and special place in Indian history cannot be denied. Through its diverse religions and cultures and languages, India has preferred to portray itself as a nation with an inherently syncretist tendency, where, no matter what the extent of pluralism, there would always remain a quest for synthesis at its core. Ayurveda's own growth, with the incorporation of Unani principles and Siddha practices is pointed out as reflective of its syncretic ability to accommodate, assimilate, adopt and adapt to the changing ethos of medical pluralism and its constituent systems. There is hardly any doubt that the medical literature in the classical texts, though oriented practically and operationally, had an "elective affinity" for and an ongoing exchange with the classical Indian philosophies (Lele, 1986; 2). But perhaps much more than syncretism, Ayurveda's medically pluralist experience - in the wake of the introduction of "alien medical systems" (Brass, 1972 ; 345) - has most often been described as one where resistance and revival have saved the system from going into oblivion. The nationalistic resonance of the word *revivalism*, whose advocates criticize the monopoly of state support for 'cosmopolitan' medicine, suggests a method of rescue, of restoration to a state that was, and this is precisely what makes for a sociologically inadequate explanation of Ayurveda's attempt at 'progress'. Even where medical sociology literature has accommodated the idea of collaborative attempts between the Ayurvedic and other medical systems in India, it has never accommodated the 'dialogue' between them, and this specifically is one aspect of medical pluralism that I will be looking at quite closely in my dissertation.

The concept of *revival* is important to Ayurveda. Several specialists on medical pluralism in India have held that after the classical period, the scope and therapeutic significance of Ayurveda diminished, especially with the disappearance of surgery (L Dunn, 1998; 149).

Ayurveda is a *regional medical system*¹⁰, that, by its very definition, connotes a certain geographical and cultural boundary, and that makes it difficult for any attempt at popularizing its use *outside* this boundary to be branded 'revivalistic'. For a western population, for instance, that is not within the geographical and cultural setting in which Ayurveda as a medical system originated, the movement to popularize Ayurveda will usually form a part of the larger movement of the 'greening' of medicine, as is the case in the United States. Such a movement will have vastly different reasons for the existence and spread of Ayurveda than is characterized by its revivalistic counterpart, and is typically the result of the increasing awareness of the risks of iatrogenic medicine. Critical to the history of the development of medicine in the US, and indeed, to American physicians' professional identity, was the "imperative to intervene" (Payer, 1988; 129). The tendency to favour 'aggressive therapy' and to mistrust nature (ibid.) has been an essential component of American western medicine, the risks of which are only now becoming realized. CAM (Complementary and Alternative Medicine) is, therefore, now becoming a specialized field within medicine as such in the US and it forms a component of the general conscious trend towards the 'herbalizing' of food and medicine. The expectations from CAM and the benefits of holistic therapy arise out of an uncertainty of the use of modern medicine, while attempts at developing the tradition of Ayurveda in India have been premised on an altogether different need.

The revival of Ayurveda stands symbolically¹¹ and practically for the humanization of medical practice (Leslie, 1998; 320), that, apart from being the result of a 'preservative instinct', may also be seen in the light of opposition to the humiliation of western

¹⁰ In his assessment of the adaptive significance of three major traditional systems of medicine in Asia, Frederick L. Dunn uses the term *regional medical system* to differentiate it from the two other categories into which medical systems may be classified based on their geographical and cultural settings – the *local* and *cosmopolitan* medical system. Consisting of Ayurvedic, Unani and Chinese medicine, the special characteristic of regional medical systems is that they are normally intracultural, although by no means, insulated from exchange with other systems, and that they are "scholarly-traditional". p. 135-137

¹¹ The word 'symbolic' deserves attention, particularly because at many points and by many social scientists, doctors and the lay, the metaphor of patriotism and nationalism has been linked to Ayurveda. In a certain sense, to believe in and to promote Ayurveda reflects one's concern for culture, tradition and the antiquity of

imperialism (ibid., 321). The overuse of this explanation, however, has prevented Ayurveda's understanding as a well-developed medical system that, apart from being ancient, is also *effective*. Until recently, western histories of the development of medical science have completely ignored the existence of Ayurveda, and it is possible to view the movement to revive, restore, and develop Ayurveda as arising in response to this tendency of science and medicine to neglect the achievements of Ayurveda as a medical system. Traditional treatments are effective, but it is the sense of nostalgia that they invoke, their place of pride in the cultural history of the people that we are reminded of to elevate indigenous systems to "separate but equal status"¹² with contemporary western medicine. But in the bigger picture, what is lost in the process is the qualities themselves of the Ayurvedic system as a curing, healing, drug-based therapy that is modeled on the principles of a 'scientific' medical endeavour.

Neshat Quaiser, for instance, in his well-known contribution to medical history and medical sociology, makes a case for Unani Tibb because it had created a specific niche for itself within the critical anti-colonial public sphere during the freedom struggle (Quaiser 2000; 29). Tibb medicine is important, but the point is made by invoking sentiments about how colonial encounters produced stories and anecdotes that became part of popular medical culture and folkloric memory. History is deployed to counter western medicine and construct an argument for the traditional. The impact of such works in the academia is that they advocate for the retention of a system of medical knowledge not as a distinct form of knowledge, but because it has often played a crucial role in matters of nationalism. It is a characteristic of traditional orders to honour the past and value symbols because they contain and perpetuate the experience of generations — one needs to doubt how far the argument of national or cultural chauvinism can be taken in an issue like health, more

civilization, while its qualities as a medical paradigm takes a backseat. This may be compared with Susan Sontag's argument on the metaphors of illness becoming larger than the illness itself.

¹² Sigerist in 1945, had argued for the establishment of an Institute of the History of Medicine in India to recognize traditional medicine in India as a symbol of nationalism and to give it separate but equal status on this basis. Quoted phrase borrowed from Foster and Anderson, p. 50

so, in the context of 'modernizing' it. We have travelled too far down history to return to our ancient and medieval past (Gupta, 2000; 214) as a means to justify the present. And if the critique of western medicine is based on highlighting how a 'classical', 'ancient' or 'national' system of medicine is necessarily better for the quality of life of the Indian people, we may have put the wrong foot forward.

None of this is to suggest, however, that to be a viable medical alternative, traditional medicine must abandon its 'traditional' component. Nor is it that to be modern is to resemble western or *cosmopolitan* (Dunn, 1998; 135) medicine. The central argument in the following chapters, and one of the most pressing reasons for me to choose this as a theme for my dissertation, will, therefore, be to show how it is possible for a scientific traditional medical system to formulate an alternative critique of western medicine by emphasizing the progress it has made in terms of carrying the enterprise of science and medicine forward. In doing so, I will suggest that Ayurveda thrives because of its real therapeutic and adaptive value, and because developments in it have medical validity. I will also try to assess, in the process, how much change Ayurveda is capable of incorporating, and suggest that 'medical research' is a sphere where the adaptive significance of Ayurveda has been evident, but that has hitherto been excluded from discussion altogether.

Analyzing a medical tradition: An alternative approach

a) The formalization of Ayurvedic knowledge

My first chapter will concern itself with taking stock of the various attempts at the professionalization of Ayurveda, and it will hope to point at the inadequacies in the sociological accounts of such a process. The belief that almost any occupation could

undergo professionalization had tremendous popular appeal in the 1960s¹³ because it reflected the generally held values of progress, rationality, science, specialized expertise, and above all, the desire for money and status. Members of the Ayurvedic occupation too embraced a theory that held out the promise of professional status, if not entirely motivated by money and status, driven certainly by the revivalistic impulse¹⁴.

Amidst a variety of approaches in medical history, sociology and anthropology that reason the 'why' and 'how' of the professionalization process within Ayurvedic medicine, I will attempt to explore 'what' the consequences of such professionalization are.

One of the most frequently used approaches has been to emphasize the emergence of professionalism as an ideology of social reform, thereby infusing social responsibility into the industrial division of labour. From this point of view, professionalization has been both an expression of occupational self-interest and a movement with broader appeal to the middle classes, mainly because it puts forward a distinctive "social ideal" that has been crucial to such 20th century developments as the welfare state. Explaining the professionalization of the Ayurvedic community with the help of this theory implies focusing on the professionalizers' social criticisms and their formulation of new social goals, thereby casting professionalization as a cultural and political development. It views the process as the result of groups asserting their status by putting a social and cultural commitment at the forefront of their attempts at professionalization.

Charles Leslie, in his thorough study of Ayurveda as an Indian medical tradition, provides us with a detailed analysis of the ideology that justified the movement to create

¹³ Around this time, particularly in the United States, there was an urge to get the "semi-professions" of teaching and social work 'professional status' and this was so mainly because the attributes of a profession were markedly different from work that was excluded from the specialized category 'profession'.

¹⁴ In fact, Charles Leslie's seminal contribution to the understanding of Ayurveda and its presence in the medically pluralist set up of India, points not only to the ways in which Ayurveda qualifies as a revivalistic movement, but highlights how the modernization of Ayurveda – originally an 'occupational' culture – was

professional institutions for traditional medicine. But, as I will try to demonstrate in my first chapter, this is only *one* possible way to approach the analysis of the professionalizing process in Ayurveda; the other is to understand professionalizers of Ayurveda as agents of the spread of scientific and technological rationalization in society.

To this end, I will try to establish the importance of claims to expert knowledge in Ayurveda - especially scientific knowledge - in establishing professional autonomy in work and prestige in society. In doing so, I will reflect on the concept of 'expertness' - its value in claiming for Ayurveda a professional status, in doing scientific research, and finally, its bearing on the concept of modernity. Historically, the rise of experts has been associated with a growth in the number of people who can monopolize skills because typically, they would have been successful in developing intricate techniques that enable them to demonstrate the socially valuable results of their efforts (Gerver and Bensman; 1954; 226). Looked at from this optique of professionalism, expertness and modernity, it is possible to understand the nature of growth of the Indian medical tradition of Ayurveda from two main perspectives. One way is to view its growth in terms of the rise of a specialized group with an expert knowledge base – a group that demonstrates increased academic interest in 'scientific writing' and intellectually interacting with scholars, academicians, practitioners and students of other allied subjects like Siddha, Unani and modern medicine. The second approach is to remind ourselves that the history of modernity is taken to involve a steady widening of the scope of institutions (Wagner, 1994), and in so far as there is an observable change in the level, nature and scope of Ayurvedic research and education in the country, I will examine the role of such institutions in shaping expert knowledge on the basis of which members of the Ayurvedic tradition can operate as a professional group.

helped by the "professionalizing ideology of medical revivalism". p. 216. I will be discussing this in greater detail in Chapter 2.

There are several accounts in medical sociology / anthropology that describe the formalization of the knowledge base of Ayurveda as a result of professionalization in it (Leslie; 1973, Brass; 1972), but few have directly concerned themselves with the analysis of the consequences of the formalization of Ayurvedic knowledge. I intend to, therefore, demonstrate (my third and fourth chapters will be directly concerned with this aspect) that though the movement of professionalization is, in no way new to traditional medicine, the ability of Ayurveda to make a significant contribution to the general process of medical innovation in the country is a result of such a formalization. And this is something that is not only typical to contemporary professionalization, it is also *modern* and is not comparable to any systematic attempt prior to it. When one talks about 'professionalization' in the traditional professions of law and medicine, particularly for the latter, an image of the doctor-patient is conjured up, as if this was the only 'site' where the traits or outcome of professionalism was visible. By putting emphasis on the consequences of professionalization in Ayurveda, I want to highlight the possible changes in another important but less discussed aspect of the profession of medicine – medical research.

In the past, (mainly throughout the colonial period, but by no means restricted to it), the medically pluralist scenario in India was characterized by a "complete hegemonization" (Kumar; 2001, xix), where the possibilities of inter-cultural interactions¹⁵ between the two medical traditions – the biomedical and the Ayurvedic – were rather limited. The indigenous systems felt so marginalized that they sought survival more in resistance than in collaboration (Kumar; 2001, xix). Total acceptance of new knowledge sometimes did mean total rejection of the old, and despite attempts to turn Ayurveda from an occupation to a profession, these were too far and few between to effect any sort of dialogue between the western and indigenous systems of medicine. Thus, by describing the way in which

¹⁵ Cultural studies have considered biomedicine and Ayurveda as different *cultures*, with distinct cosmologies and idioms of thinking about health and death.

Ayurveda is organized as a medical system in India today, I will try to show that today there is an intellectual climate in which medical systems survive and strengthen each other not in a relation of resistance, hegemony and syncretic or 'adaptive' ability, but by collaborating.

b) The organization of research

My second chapter will be concerned with the manner in which research is conducted in Ayurveda¹⁶, the methods and principles used, the procedure in which conclusions are drawn, and the assumptions they are based on. In giving an account of the procedures and guidelines of research that professionals in the medical tradition of Ayurveda have recently engaged in, I hope to highlight, in this chapter, the process of the genesis of a 'scientific fact' and the general standards of appraisal in Ayurvedic research in the country today. The purpose of this exercise is to point out that there is good reason (and evidence) to challenge the long and widely held belief that Ayurveda is "closed" and "non-experimental" in nature (Madan, 1969; 1475), and that it lacks the scientific temper that is required for any body of knowledge to be branded 'scientific'.

Any scientific activity necessarily involves systematic collection of data, reliance on observable facts, and analysis of the data with the help of models using logic and rationality. A distrust of one's knowledge appears to be basic for the scientist and he / she, therefore, welcomes innovation. (Subbaram, 1998; 3). A large part of the research in Ayurveda today is concerned with testing claims made in the classics, re-testing remedies documented therein, and falsifying those that cannot scientifically be proven¹⁷.

¹⁶ I have collected data only on the nature of research activity in institutions dedicated to Ayurvedic research. I have excluded from my analysis research that may be undertaken by individual Ayurvedic practitioners and physicians because this was outside the scope of a 'secondary' research. But this choice makes a deeper point that strengthens my argument, and that is, most of the research that is leading to an advance in the knowledge base of Ayurveda are systematic attempts by institutions that do research, and whose results are documented and known, unlike independent research attempts of a single *Vaidya* who would share the outcomes of his research with little more than members of his family who are in the same profession.

¹⁷ I am not aware of any comprehensive study done on the fate of claims made in the Caraka or Susruta Samhita that stand scientifically challenged. Although, I have come across instances of research studies that invalidate classical Ayurvedic claims, I do not know if the past claims are actually abandoned or not.

It is important to recognize that this entails a shift from the manner in which Ayurvedic research has hitherto been organized. Although scientific, the culture of documenting and recording the results of one's research, making the procedures and steps known and open to scrutiny by any scientist as well as the public, was never a characteristic of traditional scientific research in Ayurveda and this must be seen in light of the fact that *most*, if not all research, was individual experimentation by practicing doctors and *vaidyas*.

By undertaking research of this sort, and by introducing the culture of documenting it, Ayurveda is making its medical science open to verification, confirmation, falsification or rejection as the case may be. There seems to be a growing realization and recognition that expanding knowledge implies a constant need to reorganize information in the light of new ones. When a scientific activity of this kind is undertaken, one is (has to be) receptive to the phenomena or events around, using *reason* as a tool to rationalize these phenomena. This demands a particular type of 'temper' where receptivity and reason form the basis, and my effort, to this end, will be to identify the adaptive significance of Ayurvedic research and suggest that it is in this culture of science and the incorporation of modern science models that one may look for Ayurveda's ability to be syncretic and to accommodate change.

Particularly interesting in this regard is the language used for articulating research results. In this connection, I will explore the value of *protocol* in medical research, and I will try to assess how the concept of protocol helps Ayurveda in making the transition from a 'closed' to an 'open reading'¹⁸ (Eco, 1984). How the concept impacts Ayurvedic medical *practice*¹⁹ may be an interesting area of future inquiry, but one that I have not directly

¹⁸ Umberto Eco's concept of 'closed' and 'open' texts can be found in detail in *The Role of the Reader: Explorations in the Semiotics of Texts*, Reprint Edition 1984, Indiana University Press.

¹⁹ This is a question that is subsumed under the broader issue of health ethics and medical work, and forms an important part of the debate on the use of skills and the quality of care in the practice of medicine. Critics say that creating protocols will lead to "cookbook medicine, to de-skilling and to a reduced quality of care", while its

concerned myself with for my present purpose. The adherence to protocol in research suggests that Ayurveda today feels that scientific questions should, in principle, be resolved through objective empirical evidence and that it is beginning to acknowledge that a professed item of knowledge is genuine if and only if it is the product or outcome of a properly accredited source²⁰.

This is an important area of inquiry because I feel that the use of modern science models in Ayurvedic research, if not yet visible, is bound to have enormous consequences for both medical thought and modernity. Scientific work, in particular, acquires significance for modernity because it involves and encourages the acquisition of new knowledge by reflecting on, and being skeptical of, traditional concepts.

c) Identifying a changed discursive space

In my final chapter, I will identify how the developments noted in the previous chapters, could have a bearing on the qualitative change in the relationship of an 'alternative' system with the 'mainstream' medical system. To this end, I will specifically look at collaborative research in medicine as a research attempt that attaches value to the use of distinctive knowledge traditions for the purpose of scientific inquiry into medicine. The most striking characteristic of such research is the reliance on the knowledge base of two paradigms of medical thought - the Ayurvedic and the biomedical - for the purpose of conducting investigations into morbidity and mortality, and I want to emphasize here that as separate styles of constructing the body and of explaining disease in it, the two medical systems are clearly separate paradigms that differ in what they consider to be legitimate scientific problems and methods of inquiry.

advocates argue that protocols reduce unwanted variations in practice, and in fact, enhance the quality of care. For more on the pros and cons of protocols, see Marc Berg's article, "Problems and Promises of the Protocol".

²⁰ R M Chisholm, whose book *Theory of Knowledge* is considered an important contribution to the philosophy of knowledge, identifies four possible sources of knowledge – External perception, Memory, Self-awareness, and Reason. (p.122) I have tried to make use of the significance of this, especially the fourth source, in ascertaining the criteria in Ayurveda today that play a crucial role in determining what is to be *known*.

The methodology of modern medical research in India²¹, which I am referring to as collaborative, makes use of contradictory and even conflicting universes of medical discourse to enquire into questions of disease cures. I want to draw attention to the implications that this may have not only for the sociology and the philosophy of science, but also in understanding the changing relationship of a scientific traditional medical system with the biomedically oriented system in a medically pluralist society.

I see this trend as reflective of a felt need that areas of expertise should overlap, recognizing that at some level, the two separate groups' respective expert labour and expert knowledge can be unified. Though I will not concern myself directly with examples of how such a symbiosis could work practically for medical innovation in a country, I will argue that it has an intellectual significance in providing a discursive space in which the two systems of medicine can be discussed, and where two distinct 'brands' of science²² can achieve what is meant by an *ideal speech situation*. I am hypothesizing, in this connection, that there is a positive relation between the professionalizing of a scientific community and its ability to contribute to collaborative research. *Expertness* as an outcome of the professionalizing process is particularly important because the idea that medical research can be advanced by collaborating can, in my view, emerge only when conceptions in the Ayurvedic and biomedical traditions begin to confront each other on epistemically equal terms. And in so far as these research initiatives do not (and cannot) be taken by single, individual scientists, I am suggesting that it depends upon the institutions in a medically pluralist society to provide what may be considered a viable

²¹ The fact that I am discussing at such length the issue of collaborative research may seem provocative. I am, in no way suggesting that *all* medical research in the country is collaborative. But I am interested in looking at the ones that are, because the consequences of collaborative research are far too important to be ignored.

²² I must clarify here that I am not suggesting the coming of age of a "unitary science" – the kind that Joseph Needham believed in. With his in-depth study of Chinese medicine, Needham initiated a systematic study of non-Western science, and in his scheme of a unitary science, local indigenous knowledge is assessed only in terms of its contribution to the development of this unitary science.

medical alternative and to preserve or change the relations between its medical subsystems.

This sort of a 'joint research culture' provides the medical profession with an opportunity to reiterate the importance of a 'rational' approach to health care, where of utmost importance is not the sanction or guarantee of "equal but separate status"²³ (Foster and Anderson 1978; 46) (although this may be a consequence of the professionalizing activity of traditional medicine and of collaborative research that is encouraged by it) but the value of the medical outcome itself, that may provide an answer to the typical health care needs of a country²⁴. This is not an experiment that merely looks to justify the use of a medical system and recognize 'other' medical care providers because it would foster an egalitarian ethos in society. Collaborative research, I wish to outline, is not necessarily an 'equalizing strategy'²⁵ of the state, a compromise on a middle ground, be it rational or otherwise.

Whatever the relationship of Ayurveda with the bio-medically oriented health care system of our country, it has never been ambiguous. Conflict, resistance, synthesis and accommodation have characterized this relation, and indeed, have been researched and discussed in no small measure in medical sociology, history and anthropology. But more often than not, academic interest in Ayurveda and in the Indian medical tradition in our country has been a component of philosophical and cultural enquiries subsumed under a general interest in Indology.

²³ Sigerist in 1945, had argued for the establishment of an Institute of the History of Medicine in India to recognize traditional medicine in India as a symbol of nationalism and to give it separate but equal status on this basis.

²⁴ It is important that we see professionalizers of Ayurveda as more than just anti-establishment champions of the health of people.

²⁵ It is important that collaborative attempts of the sort that I am referring to are understood as not being motivated by this factor, because one may recollect other examples where the 'professional' status of a medical system can be attributed to this attitude alone. In the "Oriental medicine vs. Pharmacy" dispute (*Hanyak - Punjaeng*) in South Korea in the 1990s, the strategy of the government started by being based on an 'equalizing' attitude. In her detailed analysis of the conflict, H. J Cho observes that in response to the demands of the disputing parties, the state's policies attempted to appease both professions' resentment at every stage of the dispute, and therefore, adopt a balancing strategy. (p.126) For more on a 'structural

The underlying concern of my work will be to show that the existing sociological literature on Ayurveda as a learned profession and as a significant component of the medically pluralist situation in India, has developed in ways that are now theoretically unproductive to important themes in twentieth century social theory. Ayurveda started out as a medical response to sickness, but gradually it grew to become and be valued as a nationalistic and cultural response. I hope that my dissertation will be able to address this problem by identifying how academic interest in Ayurveda can be reoriented to highlight the ways in which it qualifies as a traditional and scientific medical system, as a profession, and as a viable medical 'alternative' in a medically pluralist society.

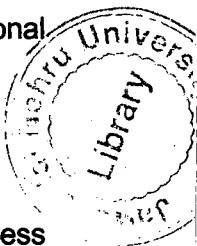
Chapter Two

The Professionalizing Process in Ayurveda: Making Institutions Matter

"Behind all present discussions of the foundations of the educational system, the struggle of the 'specialist type of man' against the older type of 'cultivated man' is hidden at some decisive point. This fight is determined by the irresistibly expanding bureaucratization of all public and private relations of authority and by the ever-increasing importance of expert and specialized knowledge. This fight intrudes into all intimate cultural questions" (Weber, 1946; 243).

In all societies the quality of expertness – that is virtuosity in the application of institutionalized skills – is highly valued and eagerly sought. Objectively, expertness is the quality of those who possess very developed skills and techniques in any given field of activity. Such skills and techniques are consciously known and can be transmitted to others (Gerver and Bensman, 1954; 226), and my effort in this chapter will be to show how, in the development of the Ayurvedic medical profession, one can locate the institutional bases for these skills, and through it, enhance one's claim to expertness. For not only is 'modern', 'western' and 'scientific' medicine associated with 'cosmopolitan' medicine, it has many times also been the only medicine that connotes 'professional medicine'.

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Experts do not arrive in a society spontaneously. They are the result of a complex process of institutional development, claims for recognition as expert, and the granting of social recognition by strategic groups. The Ayurvedic movement is a case of a *traditionalistic interest group* to legitimize itself and achieve recognition and status in a modernizing society through the establishment of educational institutions, through internal professionalization and through government patronage (Brass, 1972; 342). Although the state and the central governments are more heavily committed to the modern system of medicine, the Ayurvedic system must be considered a fully entrenched component of the

medical, educational and administrative structure of the country (ibid., 348). In this sense, a dual system of professionalized medicine has evolved in India with separate institutions to educate physicians and to regulate the practice of modern and traditional medicine (Leslie, 1973; 216).

Growth of professionalized medicine in India

Milton Singer, in his introduction to the collection of essays edited by him on the modernization of occupational cultures in South Asia notes that the South Asian case is peculiar because of a fairly high degree of elaboration of a self-conscious social theory of the social system, and therefore, of the occupations that form its part. The features of the occupational cultures of this region that are most often noted are the hereditary specialization and division of labour by family, caste and religious sect; the ranked hierarchy of occupations in terms of ritual, prestige and power; the organic interdependence of different occupational groups; the special cult of deities, rites and myths with particular occupations; and a theodicy rationalizing and justifying the entire social system in terms of the scriptural doctrines of four social orders or stages of life (Singer, 1973; 1). Among the attributes that make a profession different from an occupation, the following may be cited as being the distinctive criteria: Formal standards for admission that requires training; presence of a systematic theory (intellectual and practical); professional authority; formal and informal community sanction of the profession, its powers and prestige; and, a regulative code of ethics.

To be classified as a profession, any occupation must satisfy two criteria; one, practical skills must be knowledge based and, two, the profession must have control over the performance of its members. According to Dean and Gupta, "a profession is an occupation based on specialized intellectual study and training, the purposes of which is to supply skilled service with ethical components to others for a definite fee or salary" (Srivastava, 1996; 84).

Prior to any professionalizing attempt, the practitioners of traditional systems of medicine in India belonged to families of physicians who practiced their arts on a hereditary basis, and their clientele generally consisted of the aristocratic classes (Madan, 1980; 17). There have been castes, families and tribes who have maintained such systems as hereditary occupations and Ayurvedic medical knowledge, for instance, would consist of private cures that ensured its status as a private, family business²⁶. Surgery is modern science's contribution to medical science, but couching for cataract was done long before the advent of European surgery and traditional surgeons practiced it more or less in keeping with the scriptures. Traditional health care was primarily organized around independent practice, on a fee rather than a salary basis.

The professionalization of traditional Indian medicine became a self-conscious movement in the last quarter of the 19th century, and the ideology that justified the movement to create professional institutions for traditional medicine has been understood to be a facet of Hindu revivalism. Leslie traces the origins of the ideology to the late 17th century in a class of Indian practitioners who were Brahman Vaidyas with some knowledge of European medicine²⁷ but who preferred to call themselves "English doctors" (ibid. 219). It was men like these that formed the nuclei of the professionalizing practitioners from whose ranks later emerged entrepreneurs who advocated the full-scale revival of indigenous medicine by supplementing it with modern knowledge.

²⁶ The closest and the most contemporary example of 'modernizing by professionalizing' is the case of the *Arya Vaidya Sala (AVS)*, a unit of Ayurvedic treatment and drug manufacture controlled and managed for hundreds of years by a family in Kerala. For the first time in the history of the Institute, it has looked externally to build a team of advisors and research doctors and physicians to streamline and professionalize the management of the AVS. Pannempally Krishna Varrier, nephew of P. S Varrier, the founder of the AVS in 1902, believes that the "institutions won't grow if it remains to be a family-run affair". Quoted by M. G Radhakrishnan in his article "A Man For All Cures" in *India Today*, March 4, 2002.

²⁷ The Indians came to be associated with European doctors as assistants, both officially as employees of the East India company and as recruits attached to private practitioners. They were "native dressers" and "black doctors", who usually began as compounders and dispensers of drugs, but after taking a requisite exam, some of them worked as doctors, for example, with battalions of Indian sepoys. For a detailed description of this phase of medicine in India, see T.N Madan, 1980 and O. P Jaggi.

Mainstreaming the Western model: Professionalizing efforts

Starting with the series of conferences in the late nineteenth and early twentieth centuries that discussed a wide range of problems of professional concern to medicine, a major representative conference of doctors was held at Kolkata in 1928²⁸. It was here that the decision to form the Indian Medical Association (IMA) was taken. Membership was going to be voluntary and any person possessing formal qualifications in "scientific medicine" (this had been defined in the Indian Medical Degrees Act of 1916 and it excluded all traditions of medicine that were not western) was eligible for membership. The objectives of the IMA were: Promotion and advancement of medical and allied sciences; promotion of comprehensive medical education; the improvement of public health; furtherance of the interests of the medical profession; safeguard of honour and integrity of the profession; and, promotion of co-operation amongst the members of the profession. It is instructive to note at this point that there was no intention to include the Indian systems of medicine within the medical 'profession' as such.

This trend was kept alive for a long time, and another milestone was the setting up of a Health Survey and Development Committee (headed by Sir Joseph Bhore) by the Government of India in 1943, that reiterated that the Indian systems of medicine had no official place on the medical profession map of India. The committee submitted its report, known as the Bhore Committee Report, in 1946 and it set out, in what was understood as a thorough and well-researched set of recommendations for the state of medical education in India, the idea of a "basic doctor" (Jaggi, 2000; 67). It was asserted that in the light of the limited resources available for the training of doctors, "it would be to the greater ultimate benefit of the country if these resources were concentrated on developing only one type of physician" (ibid.) – the basic doctor²⁹, who would fall, it was

²⁸ As a professional body, the IMA's growth has been quite steady. By 1975, it had over 700 branches all over the country and a membership approaching 50,000.

²⁹ The problem with the Report's 'basic' doctor – "the highly qualified physician" – is much more than exclusion of traditional systems. It did not even include the auxiliary personnel required by the profession. Its concern was mainly with the preservation of a uniform standard of medical education and the inadequacies in areas of

assumed, under the category of western medical training. Detailed and elaborate suggestions were laid out for both undergraduate and postgraduate medical education, the establishment of committees that would be responsible for laying down standards in respect of postgraduate facilities and basic facilities for medical colleges, and to meet the shortage of teaching staff in such colleges. And everywhere, 'medical' referred to the western system, and profession connoted the organization of medical work as depicted by the western model.

This report was important in many ways, and several of its suggestions went on to be the guidelines for future policy on the medical profession in the country, for instance, the recommendation regarding the sovereignty of the 'university' as the only body that had the authority to grant medical qualifications. But the committee disclaimed competence to recommend any policy for indigenous medicine other than that its practitioners should not be allowed to call themselves doctors.

Two 'model' institutions were set up by the Government of India outside the control of the Medical Council of India to experiment with new ideas and procedures in medical education. These were the AIIMS, established by an Act of Parliament in 1956 (suggested by the Bhore Report), and the Postgraduate Institute of Medical Education and Research, established in 1967. The government of independent India acknowledged the Report and the first five-year plan included outlays on health care and medical education (*First Five-Year Plan*, GOI, 1952, 512). The plans affirmed that medical education, medical research and medical relief are intimately interconnected. It is generally accepted that the quality of medical relief is vastly improved by the presence of a teaching hospital and college in any area and that the quality of medical education

medical education and research and health care. It noted in a comprehensive and systematic way for the first time that India needed to take steps to address the acute scarcity of medical and paramedical personnel.

is greatly improved in an atmosphere of medical research. It is, therefore, obvious that the planning of these activities should be taken up together.

Medical education entails three inter-related activities – teaching, medical service and research, and medical education is a pre-requisite for providing medical facilities on an organized basis.

It was recognized that the scale and character of the equipment provided in a college plays an important role in the achievement of the results of medical education. In this regard, a Committee on Plan Projects was appointed by the Government of India, which submitted its Report on Medical Colleges and Teaching Hospitals in 1964. The Report gave a detailed and comprehensive assessment of a list of requirements for the purpose of an improved state of medical education in colleges across the country, but was evidently based on the western model of organization of medical education³⁰. The team was aware that medical services and facilities in the country fell far below the required and desired standard at the time of the survey, but the sample base of the work-studies of the team entirely excluded the Indian systems of medicine. This was despite the fact that the late 50s and 60s witnessed maximum student agitation and strikes all over India, where the demand was to improve the education experience in Ayurvedic colleges, including both curriculum and infrastructure. Clearly, both the Bhole Committee Report of 1946 and the Report on Medical Colleges of 1964 described the existing medical system as if Ayurvedic and Unani medicine did not exist.

³⁰ The requirements were noticed in the following divisions of medical colleges: Administrative wing, Department of Anatomy, Physiology, Bio-chemistry, Pharmacology, social and preventive medicine, pathology, bacteriology, forensic medicine, common teaching and supporting facilities, clinical departments, residential accommodations, planning considerations and costs, additional requirements of teaching hospitals, and equipment (p. 70-71). The recommendations on surgery in the Department of Anatomy, for instance, were entirely premised on the western model of teaching and understanding of the human anatomy. Every move to improve standards followed notoriously the suggestions made in the Bhole Committee Report.

'Alternative' efforts

The need to professionalize was being experienced by the systems of Indian medicine, particularly by practitioners and students of Ayurveda almost parallelly. Before I discuss the consequences of the process of professionalization in Ayurveda, a recap of existing arguments is in order. The first truly ambitious project in this direction was initiated in 1822 by a government order to start a School for Native Doctors in Calcutta, with instruction in Hindi and a course that combined indigenous and European medicine. Similar schools were established many years later in Bombay and Madras, and at the same time, the Calcutta Madrassa and the Sanskrit College (which were subsidized by the East India Company) introduced modern medicine and anatomy into their curricula (Leslie, 1973; 220). The purpose of attempts of this kind, was, however, not to professionalize Indian medicine as such, but rather to revitalize traditional learning and invigorate institutions of learning in a way that could give "that stimulus to the native mind which it needs on the subject of education, and for eliciting the exertions of the natives themselves for their own improvement"³¹ (ibid., 221).

This, nevertheless, did provide the ideological ground for professionalizing reforms. It made innovations more desirable by identifying them with a lost culture that was more open, scientific and more profoundly "Indian" than inherited tradition. The fundamental ideas were to eliminate quackery by introducing objective standards of training and practice and to increase the competence of practitioners by incorporating modern knowledge. The ideals were progress and standardization – two of the most revolutionary ideals of modern culture. From the late nineteenth century they were linked with increasing intensity to nationalist sentiments³² (ibid., 224)

³¹ These were William Adam's reports on educational institutions in Bengal and Bihar in 1835. For details, see Adam, "Report on the State of Education" pp.195-200.

³² In the 1870s, Rajnarain Bose called on Bengalis to give up foreign habits, use indigenous medicine, and promote indigenous industry.

Regional and national associations of Ayurvedic physicians worked for state recognition of their profession actively and they were joined in this by associations of Unani practitioners as well. The Usman Committee Report published in 1923, was the first major governmental study of professionalized indigenous medicine. Like its successors after independence – most notably the Chopra Committee and Udupa Committee Reports in 1948 and 1959 – it recommended that the state create bureaucratic structures for indigenous medicine parallel to those of modern medicine. A Department of Indian Medicine in the Ministry of Health would be guided by a General Council of Indian Medicine composed of *vaidyas*, *hakims* and doctors sympathetic to the indigenous systems. The idea was clearly to have autonomy in relation to critics who represented the modern medical profession. In the proposals and recommendations of such reports, despite the common intention of reviving indigenous medicine by educating practitioners in modern knowledge and skills, one can discern different paths to achieve the same; while some would replace the traditional organization of medical practice with highly rationalized and bureaucratic institutions, others would want to utilize traditional institutions. This difference indicates the way that massive changes in the social organization of modern medicine in the intervening period had defined new standards for the revival of indigenous medicine (ibid., 226).

It is important to remember that throughout the history of its professionalization, the real impetus has come from within the Ayurvedic community itself. Paul Brass reminds us by the use of the term “traditionalistic interest group” (Brass, 1972; 342) that the Ayurvedic physicians’ professionalization efforts describe an interest which uses traditional symbols and which favours the revival of ancient values, but whose clientele does not necessarily come exclusively or even predominantly from the traditional sectors of contemporary Indian society and whose goals are not necessarily opposed to some forms of modernization.

Charles Leslie has been a serious advocate of the view that the professionalizing movement in Ayurveda has witnessed a paradoxical trend throughout its history, where, success has always led to failure (ibid., 232). The successful creation of bureaucratic institutions for Ayurvedic education and practice led to a sense of failure among professionalizing *vaidyas* because these institutions failed to establish an autonomous class of physicians whose prestige equaled or was greater than that of modern medical doctors. In Calcutta, and eventually in Madras and other centres of medical revivalism, this ideological failure was one cause for local or regional decline in the scope or effectiveness of professional organizations. Paul Brass views the movement in a similarly skeptical manner. He asserts that the attempts to acquire professional status have been hindered by internal conflict within the Ayurvedic movement³³. "Ultimately", he states, "the success of the movement has depended less on the proven value of the system of education provided in Ayurvedic institutions than upon the ability of prominent leaders in the movement to identify the goals of Ayurvedic education with a form of indigenous modernization adapted more to the needs and cultural values of India than to borrowed international standards" (Brass, 1972; 343). The consequence of professionalizing efforts in Ayurveda, according to this view, have led to nothing more than the creation of a large and entrenched educational establishment producing hundreds of graduates annually who are qualified neither in Ayurvedic nor in modern medicine but who demand the status and privileges of modern medical graduates. My third and fourth chapters will hopefully demonstrate that the consequences of professionalizing efforts have been much more than just that.

Paul Brass has mainly formulated the problem of professionalization in terms of the relationship between the political system and the educational system, where he sees

³³ The practitioners of traditional systems had their own debates regarding a 'pure' or a 'modernizing' approach to both education and professional practice. These debates between and among the different practitioners of medicine are ultimately concerned with the nature of the new society that is in the process of being made in India since independence. So far, according to T. N Madan, modern doctors and the 'modernizers' among the practitioners of traditional systems have had the upper hand (p.26).

those within the Ayurvedic movement as an educational interest group which has tried to acquire legitimacy and professional status through political methods. In this attempt, professionalization has been used partly as a mechanism to develop uniform standards considered desirable in themselves, but also very largely as a political instrument to create an organized body of practitioners able to apply political pressure on the state and central governments to influence public policy relating to Ayurveda and simultaneously to counteract the influence of the organized modern medical profession (Brass, 1972; 343).

Though the Committee on Indigenous Systems of Medicine was the first of its kind to be set up by the Central Government in 1948, there have been several enquiry and recommendation committees that were initiated by provincial and other state governments from 1921 to 1947 that addressed directly the question of medical education, research and practice of indigenous medicine. The first one to be officially designated the task of looking into the level of professionalization in Ayurveda was the Committee on Indigenous Systems of Medicine set up by the Government of Madras in 1921, and it actively engaged with the question of 'registration'³⁴. It asserted that the purpose of medical registration was only to discourage dishonest practice and that absolute prohibition of unregistered practice as obtaining in the United States of America was less suitable to conditions in India, and that every effort should be made to secure certain rights and privileges to the Registered as was done in the United Kingdom.

Evolving 'standards' in Ayurvedic education

It is, indeed, possible to draw parallels at various levels between the professionalization process of western medical systems in Britain, and of Ayurvedic medicine. An important

³⁴ It is interesting to follow the concept of registration in India through the centuries pertaining to the Indian systems of medicine. As far back as May 1897, the Indian Medical Gazette argued in favour of one register, with no lines of demarcation between Hakims, Vaidis and doctors. Although this could have been a practical possibility at the time, future committees, of course, thought it better to maintain two registers for the two traditions of medicine. For a lively debate on 'One Register or Two', see *The Report on Indigenous Systems of Medicine*, 1948, Appendices, Vol. II, pp. 135-137.

step in the creation of expertness in both has been the importance of a medical register in providing the boundary that separates the qualified from the unqualified.

The history of the medical profession has been one of exclusion. In the experience of medical systems in Britain, for example, alongside several less important subsequent pieces of legislation, the Medical Act of 1858 sought to protect the profession by ensuring a territorial readjustment of boundaries, enabled by the maintenance of a register³⁵. In future, one single public register for all legally recognized practitioners would be published, under the official authorization of a General Medical Council. All names would appear equally on it from the most elite consultant down to the humblest member of the London Society of Apothecaries so that all ranks of regular practitioners appeared together as 'insiders', lined up against the 'outsiders' – the unqualified homeopaths, medical botanists, quacks, bone-setters, itinerants and the like, who were automatically constituted, by exclusion, into the 'fringe' (Porter, 1996; 48).

The Parliament, therefore, was able to achieve what the doctors could never; it could, symbolically at least, unite the members of a medical system within the profession, by defining them against a common Other.

Two significant elements in the granting of recognition, (mainly 'social' recognition), are the *social visibility* of those claiming expertness and *social distance* of the conferring groups from the alleged experts (Gerver and Bensman, 1954; 226). By 'conferring groups' is meant both those in power to 'grant' recognition *and* the public, both of whom must recognize the specificity of function of a particular kind of expertness. In the Indian as well as the English medicine example, it is possible to see that the groups that grant

³⁵ There were three sub-divisions, so to speak, within English medicine – physicians, surgeons and apothecaries. The Medical Act in this sense proved an ingenious compromise, placating the reformers as well as protecting the profession by ensuring that in the resultant readjustment of territorial boundaries, no branch of the regular profession came out as losers. To satisfy the Colleges of Physicians and of Surgeons, the

recognition of professional status to qualified medical personnel are 'distant' in the sense that they are least technically qualified to grant recognition. Recognition is then based not on a knowledge of expert procedures, methods and information, but instead upon the imputed consequences of expert action. Thus, recognition of expertness carries with it the conferring of prestige. Hall considers community sanction as the most important of all the attributes of a profession (Srivastava, 1996; 86). Along with formal, informal community sanction of the profession is an indispensable component of the recognition of a profession, where the training process and the professional standards set by the profession itself must all be duly recognized.

Professionalizing efforts in Ayurveda at present seem to be less internally divided over the choice of a particular brand of revivalist philosophy. Rather, the thrust seems to be on qualifications, standards, criteria, and recognition in medical education and research. In one of the debates³⁶ that led to the all-significant Report of 1948 (*Report of the Committee on Indigenous Systems of Medicine, 1948*) on the question of the desirability of a system of registration and control with respect to traditional medicine, it was strongly felt that traditional medicine needed a body like the Indian Medical Council (ibid., 64) that would look into the issue of setting All-India *standards* for education and research in Ayurveda. A degree course, a curriculum of studies (that would be distributed over a period of five years of higher study), and a system of examinations to be held before and after the commencement of the course was deemed relevant for education, and compilation of a pharmacopoeia of standardized drugs was sought to be brought about as a result of research on both Ayurvedic and "modern scientific lines" (ibid.). The breakthrough that this report gave to the professionalization process in Ayurveda was the recognition of the need to create, develop and *institutionalize* expert knowledge on traditional medicine on

tripartite division of English medicine was, however, not abolished. For a fuller account of disease, medicine and society in England from the 16th to the 19th centuries, see Roy Porter.

³⁶ This debate took place on the second day of the session (24th march, 1948) between two well-known practicing *vaidyas* of the time— Sri Purshottam Shastri Hirelekar and Sri Hari Shastri Paradkar. While the former opined that registration should be optional, the latter was of the view that it should be compulsory.

universalistic lines, guided by uniform standards. The onus of starting a "model institution" (ibid., 64) for teaching Indian medicine lay on the government, but the composition of all panels or committees that would go on to form the curriculum for education and research would be restricted to scientists, *kavirajas* and doctors of traditional medicine.

With regard to the aspect of education and Ayurvedic medical institutions, the dissatisfaction over the quality of staff, number of entrants, equipment and "technical education" in the then prominent schools and colleges of Ayurveda is evident from the debates that resulted in the Report of 1948 (See *Appendices*, Vol. II, p. 95, for instance). It realized that the path to the privileges that professionals in modern medicine enjoy, began with first upgrading the Ayurvedic institutions of learning themselves, with full government support to build the required infrastructure, to acquire relevant literature, books and periodicals, and to keep abreast of modern medical discoveries and processes.

Although there has been a very rapid expansion of both undergraduate and postgraduate medical education in Ayurveda, there has been no study of any significance in this field. Charles Leslie has pointed out that though there are dual systems of professional medicine in India, there are also important connections between the two systems. The most direct connection is through the dominant system of institutional training itself, in which both Ayurvedic and modern medical subjects are taught.

As a case example, it would be interesting to examine the course structure of a prominent institution of Ayurvedic undergraduate learning in New Delhi. The Ayurvedic and Unani Tibbia College is affiliated to the University of Delhi and it confers a Bachelor of Ayurvedic Medicine and Surgery (BAMS / *Ayurvedacharya*) at the end of five years – what the college prefers to introduce as the 'Indian' equivalent of the MBBS degree. Though the medium of instruction and examination is Hindi, (while for Unani medicine, it is Urdu and

Homeopathy is taught in English³⁷), the subjects taught and the model of curriculum adopted is based on the model of modern medical education.

The curriculum for the first semester consists of the following papers: Basic Principles of Ayurveda, I (*PadarthaVigyan*); Basic Principles of Ayurveda, II (*Ashtansangraha*); History of Ayurveda; Physiology (*Sharir Kriya*); Anatomy (*Sharir Rachana*); and Sanskrit. The second semester comprises: Pathology (*Madhav Nidhan / Rogviyan*); Hygiene (*Swastavritta*); *Charaka Purvana*; Pharmacology / Materia Medica (*Rashastra / Dravyaguna*); Jurisprudence (*Agadantantra*); and Toxicology (*Vishvavigyan*). The third and the final semester trains in: *Charaka Uttarardha*; Surgery (*Shalyatantra*); IENT (*Shalakyatantra*); Gynecology (*Prasutitantra*); Medicine (*Kayachikitsa*); and Pediatrics (*Kaumal Bhritta*). The course work is followed by an internship that lasts for a year, where the student experiences and learns Out Patient Department (OPD) treatment, and experiences what it means to be a physician. The training is received mostly in hospitals that are attached to the college itself, and all aspects of the educational and research establishment are in keeping with the 'Minimum Standards & Requirements for Ayurvedic Colleges and Attached Hospitals' as set out by the Central Council of Indian Medicine³⁸. The establishment of the latter in 1965, was an important landmark in the growth of the profession, because it implied finally, the creation of a formal authority that kept close contact with the concerned professional educational institutions with a view to ensuring the maintenance of adequate standards of instruction.

Another landmark in the field of education was reached, when in 1946, the Chopra Committee directed the educational process towards reaching the goal of achieving

³⁷ The University of Delhi also conducts courses in Homeopathic medicine, and has instituted the Nehru Homeopathic Medical College to offer a BHMS degree. Though Homeopathy is not taught in the same institute as Ayurveda and Unani, they are usually listed together as Faculties that are affiliated to the University of Delhi and that offer non-mainstream medical degrees.

³⁸ Right from guidelines on the provision for outdoor treatment in hospitals, the allocation of space for staff and various departments within the hospital, to the space and staff requirements for Undergraduate and

integration with the western medical education system. Later, in 1949, the Pandit Committee further strengthened this recommendation. The Chopra Committee stated ".....we have envisaged a scheme of education by which the teaching of Indian medicine should include the essentials of western medicine, particularly in those branches where Indian medicine is deficient and as such bilateral instructions should be given till such time as our ultimate object of integration leading to synthesis is achieved." By the year 1958, there were 76 institutions of Ayurvedic teaching in the country (source: Leslie in Singer, 1973; 236, *figure 2*). Most, out of these adopted an integrated pattern of education, improved their facilities, raised entrance requirements and systematized their curricula (*ibid.*, 238). Around this time the universities in the country started taking note of Ayurvedic institutions and several integrated institutions were affiliated to universities. Academic control of the remaining teaching institutions was vested in the State Boards constituted by the state governments.

The core issue for the curriculum of instruction in Ayurvedic education is no longer whether the government should adopt an 'integrationist' perspective or whether the 'purist' orientation to education, research and practice is more beneficial to the profession. If the above example reflects the institutional and educational organization of most Ayurvedic colleges in the country today, there exist separate specialized training programmes along 'purist' preferences such as that of the *guru-shishya parampara* or the pupilage system of instruction³⁹.

Postgraduate colleges of Ayurvedic education, the CCIM develops and maintains minimum standards of education for all institutes of Ayurvedic learning across the country.

³⁹ This system has its antecedents in the *to/s* many centuries ago, which were schools conducted by a guru who managed to collect a number of aspirants in Ayurvedic education. The course of studies was based on the Sanskrit classical works on medicine, where the students were also taught practical methods of identifying drugs, preparing medicines and dispensing them. For details on this and proposals on newer methods of instruction in Ayurveda, see "Education and Medical Institutions", *Report of the Committee on Indigenous Systems of Medicine*, 1948, pp. 95-113

The Rashtriya Ayurveda Vidyapeeth⁴⁰ (RAV) is premised on the traditional mode of teaching in the pupilage system. The assumption is that experience and seniority (*gurus* are typically sixty years of age or above, who have had a minimum of thirty to forty years of clinical experience) in the profession results in a kind of specialized knowledge and expertness that cannot adequately be provided by young entrants in the profession. Its rationale also includes fundamentally the concept of imparting what the physician or doctor has learnt from experience, and not necessarily from formal channels of education.

The student is a resident at the house of his / her teacher for a period of one or two years depending upon the module of expert instruction chosen; the '*Chikitsa Guru Shishya Parampara*' lasts for one year, and, the '*Acharya Guru Shishya Parampara*' for a period of two years. While the language of instruction in the former is either English or Hindi, the latter requires knowledge of Sanskrit⁴⁰ to enable the reading of the Samhitas in their original versions under the guidance of a guru. Facilities are available for practical and clinical training and a great amount of emphasis is laid on the integration of theory and practice. The course does not offer a degree - it is outside the formal system of Ayurvedic education, with no fixed syllabus to follow - and it only admits postgraduate students who have already secured a PG degree from a formal institute of Ayurvedic learning.

Out of an all-India total of 77 postgraduate colleges of Indian Systems of Medicine and Homoeopathy (ISM&H) comprising the systems of Ayurveda, Unani, Siddha and Homoeopathy, almost 70 per cent are colleges of Ayurvedic learning (source: *Report of the ISM&H, 2002; 197*). With very few exceptions, they are modelled on the 'integrated' structure of instruction and curricula⁴¹. While the total number of Ayurvedic colleges in

⁴⁰ I have collected data on the institute from the office of the RAV, which is situated in New Delhi, though the courses are run at the residences of Gurus all over India. At present there are 18 gurus on the roll, and each may have upto five students at one time. The number of female students enrolling for the course is lesser than male students, and the most frequently sought training for female students pertains to *Prasutitantra* (gynecology). The stress on acknowledging antecedents is quite evident in this mode of imparting training.

⁴¹ One does, however, need to raise the question whether Ayurvedic higher education should be content with teaching only medical courses, because no matter what the extent of the 'integration' with modern medical

1982 stood at 98, a decade later the figure stood at 101. But by 2001, the number of colleges had approximately jumped by one-and-a half times to 269⁴² (source: 'List of state-wise number of practitioners of Indian Systems of Medicine', CCIM). All India figures for admission capacity in colleges in higher education in Ayurveda in 1991 stood at 1,775⁴³ (source: ISM&H, 1991, 105). In ten years it has increased by four-and-a-half times to around 7,883. (*Annual Report, MHFW, 2001-2002, 307*).

Now if we look at the comparative figures of the number of students admitted into PG courses in Ayurveda from 1981 to 1991, we notice that this is constantly on the rise. While in 1980-81, 181 students were admitted to PG colleges, out of which a total of 98 graduated (a pass percentage of 54) with the qualification aimed for⁴⁴, in 1985-86, the proportion of students passing increased to 70 per cent (132 pass-outs of 187 admissions). This noted a further rise to 87 per cent in 1990, with a base intake of 170 students (*Indian Systems of Medicine and Homeopathy in India, 1991; 233*). Comparable figures for the 'mainstream' medical system of our country indicates though, that despite the number of modern medical colleges being more or less the same as that of Ayurvedic colleges, there is a huge difference in the admission capacity and final degree holders in the two types of institutions⁴⁵.

subjects, or the expert quality of their teaching, if subjects like Mathematics and Statistics (which are relevant to biomedical sciences) are not part of the curriculum for medical students of Ayurveda during their training, they do not learn the art of reasoning with statistics, calculus, vectors, Boolean Algebra system and theory and role of computers in medicine. And this, one must agree, *should* be a significant component of medical knowledge today – Ayurvedic or biomedical.

⁴² In which the share of UG colleges is 211 and that of PG is 58.

⁴³ The figure is only for government controlled universities.

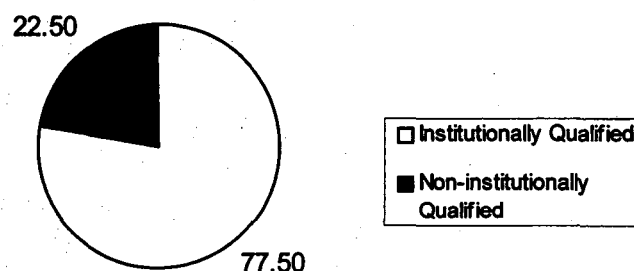
⁴⁴ Though one is tempted to conclude from this discrepancy between students admitted and students passed out, that PG colleges are strict about the level of academic attainment in every year of postgraduate study, with the result that only a proportion of students admitted to 1st year study ultimately pass out with a PG degree. This, however, cannot be said conclusively because the reasons for fewer pass-outs could be several, including students' attraction to possibly other courses of study in the middle of their PG programme in Ayurvedic medicine. For example, Summary of medical care facilities under ISM as in 1995. (*Health Information of India*)

⁴⁵ In 1980-81, the total number of medical colleges were 109, with 11,431 admitted in the first year and 12,170 qualified. In '85-'86, the number of colleges rose to 122, and 12,017 students were admitted, out of which 11,470 passed the final year examination. And in 1990, 11,389 were admitted, while 13,934 received a degree. (*Health Information of India, 1995-96; p.87*).

Institutionally Qualified knowledge: The emergent idea of 'expertness'

The medical manpower statistics of Ayurveda indicate that in the state of Delhi alone there has been a continuous increase in the number of registered practitioners. Since its inception upto the year 1983, the Delhi State Board counted 632 registered practitioners of Ayurveda, and noted an increase of seventy per cent by 1986, i.e., the number of practitioners increased by 446, touching 1,078. The incremental addition from 1986 to 1997 was 68 per cent. Thereafter, an increase of 230 per cent took place by the year 2000, which means that the figure for registered practitioners in Delhi stood at 6020 (source: *Central Register of Indian Medicine*, Vol. I, Vol. II and Vol. III, Delhi State). The proportion of ISM&H doctors (including both the Institutionally Qualified - IQ and the Non-Institutionally Qualified - NIQ) in the year 2000 per 10,000 was 8.0 (i.e. out of a total provisional population of 1,37,82,976, registered practitioners of ISM&H totaled 10,995) - the All-India proportion for which was 6.6. Delhi's average on this parameter has been higher than that of the All-India figure.

Registered Practitioners of Ayurveda, 2001

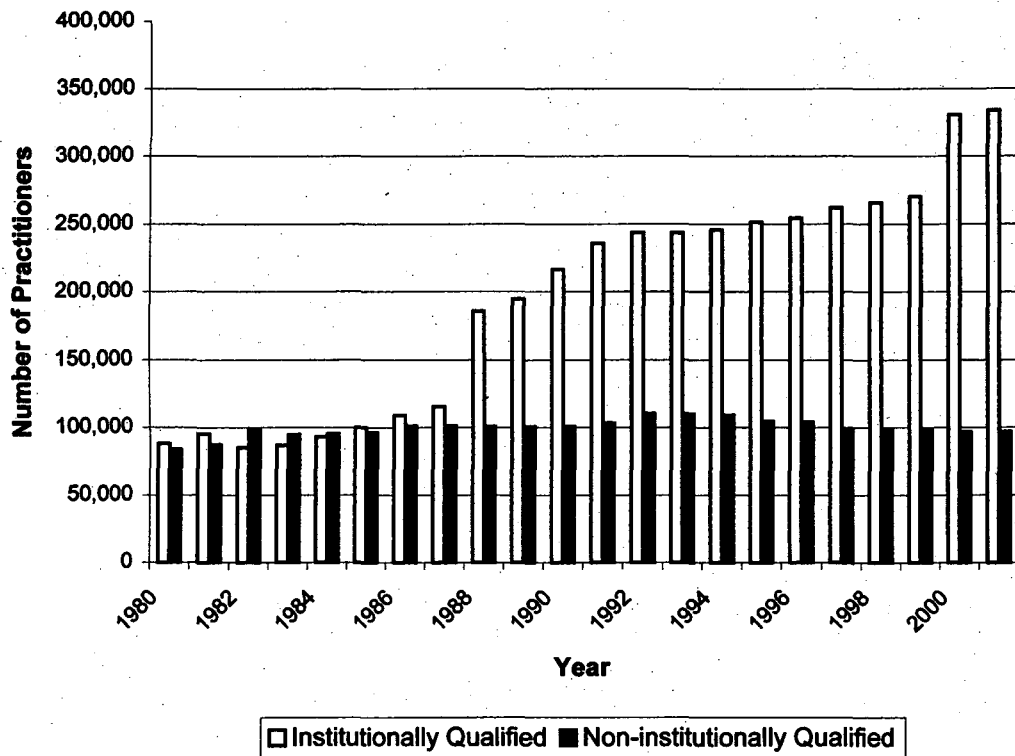


The above pie diagram shows the proportion of professionals, all India, in Ayurveda who are formally trained in institutions of higher Ayurvedic learning vis-à-vis the non-institutionally trained.

An interesting observation with respect to non-institutionally qualified practitioners is that in the Report of 1948, where the first systematic discussion on the registration of practitioners of Indian medicine took place, the decision to maintain a separate register

for Indian medicine (Report of the Committee on Indigenous Systems of Medicine, 1948; 136) was premised on the fact that in due time, the standard of medical education in Ayurvedic institutions would rise, which would result in the gradual fading away of the non-institutionally qualified practitioners. Although that has not occurred, what is of relevance for our present purpose is that the number of IQ practitioners is not only greater than the NIQ, but that the former is growing at a much faster rate than its non-qualified counterpart. This has important conclusions for the phenomenon of expertness.

Yearwise Ayurveda Practitioners



The above bar chart gives us a clear idea of the steady preference for professional qualifications in Ayurveda – qualifications that are institutionally endorsed. In the two decades from 1980 onwards, it is the IQ professionals that have contributed to the striking

increase in the number of Ayurvedic practitioners, and this in turn, reflects the growing gap between IQ and non-IQ professionals.

The relevance of these figures lies not only in the fact that they reflect how the Ayurvedic medical system has been organized over the past few decades, but how its organization thus has enhanced the profession's own qualities of acquiring a clientele and skilled training based on an extensively theoretical body of knowledge. As any substantive field of expertise increases in prestige, larger number of workers are attracted to the field (Gerver and Bensman, 1954; 232). Emphasis on the development of the Ayurvedic medical tradition as a recognized health care discipline and the institutional arrangements to promote Ayurvedic medicine, curricula and careers gives an impetus to the idea of institutional experts. This, in turn, encourages practitioners in the profession to value it as a safer way of increasingly developing prestige and legitimacy.

Though the goal of professionalizing *vaidyas* through the years has been to achieve equality with modern medical doctors (Leslie, 1973; 233), the concern was not merely to be revivalistic. An outstanding characteristic of the modern professions is that apart from the control that statutory bodies may exercise over them, the professionals themselves look after the activities and interests of individual professional workers through voluntary professional associations (Madan, 1980; 21) because important to the professional class today is their self-centredness, the over-riding concern with their own ambitions and frustrations (ibid., 295). Professionals in Ayurveda, as in any other professionalizing occupation suffer from a high degree of 'need for achievement'⁴⁶, which could mean merely acquisitive achievement or productive self fulfillment (ibid. 295), or both.

⁴⁶ According to Ronald Dore, this is a characteristic of the members of modern professional classes. The 'diploma disease' is a corollary of this need for achievement, which, Dore asserts, is not so characteristic of any other profession as it is of the doctors. For more, see Ronald Dore's *The Diploma Disease: Education, Quantification and Development* (Allen and Unwin, London, 1976).

Just as corporate administrators ultimately gain legitimate authority to control work from the legal status of 'officer' granted by the state, so also do the professionals gain their authority from the state, most clearly, but by no means exclusively, through restrictive licensing that allows only them to perform and control particular kinds of work (Freidson, 1975; 9). I will note in detail (in the fourth chapter mainly), the consequences and advantages of the professional model in encouraging work that can typically be performed by professionals in Ayurveda for collaborative research in medicine. But it will suffice to point out here that it is because of the standardization and formalization of the knowledge base of Ayurvedic teaching, research and practice that these inter-related activities of the Ayurvedic medical profession have a bearing on the creation of 'functional specificity' within the profession.

As will be of central importance in my next chapter - where I will be examining the organization of the principles of modern Ayurvedic research - in marking a profession, different types and aspects of expertness become recognized and embodied in tables of formal organization. Much of our social theory on the analysis of Ayurveda as a profession has concentrated on revivalism in a way that obscures the importance of the concept of functional specificity. According to Parsons, "specificity of function" is an institutional feature that is common to the professional and commercial spheres, and is not something that is "natural" to human action generally (Parsons, 1939; 460). The institutionalization of education and training of not just physicians, but also those who teach and carry out research in Ayurveda has been an important component of the professionalization process in Ayurveda. The skills learnt and the ability to perform specific functions and roles as a professional, is one of the most prominent features of the division of labour in medicine today.

Professionalization thus, is a fundamental ingredient in any programme on the modernization of medicine. One has to, therefore, look for ways in which to understand Ayurveda as a profession in terms of its ability to play a modernizing role in transforming relations of resistance and struggle between sub-systems in a medically pluralist society. The frequent employment of the revivalistic idiom to claim an equal status for traditional medicine obscures the potential contribution that medical revivals may have on the transforming capacity of a medical system.

What I have tried to argue in this chapter is that revivalistic explanations of the Ayurvedic movement are not incorrect, but that they are inadequate in understanding its consequences fully. A revivalist explanation, along with implying reliance on the past to justify the present, also typically ascribes to the movement the single rationale of correcting, as it were, a state of 'professional monopoly' in a society⁴⁷. That this ideology could have gone a long way in enhancing "functional specificity" within the profession, has not been reflected in the analyses of the professionalization process in Ayurveda hitherto. There is a crucial relationship between institutional qualification, expertness and organizational power, and unless we revitalize the debate on the Ayurvedic medical profession in a way that helps it to function in a modern society, we will never recognize that the profession has produced experts who have increasingly earned prestige, legitimacy and the technical skills that may be used in qualitatively different kinds of research in medicine. The dynamics of expertness can also be fruitfully viewed as indicators of change in the larger society (Gerver and Bensman, 1954; 231). Professions play a modernizing role in developing societies and a modernizing⁴⁸ society is, indeed, a professionalizing society. The presence of professions is, by itself, no guarantee of a

⁴⁷ In the Korean case that I have mentioned earlier, the analysis of the movement by the Oriental Medicine (OM) practitioners can be described as a result of the sectional interests of western medical and OM practitioners. The lack of division of labour in prescription meant that continual economic tension caused friction between the two and that the two were in a state of constant feud. The motivation to seek the help of state policy was clearly one that intended to correct the professional monopoly that western pharmacists exercised at the time.

generally modern society or the prevalence of certain ethical values, but the professions do have a large role to play in development (Madan, 1980; 296).

⁴⁸ Although I would disagree with T.N Madan who believes that doctors are modernists, and not 'modernizers' (p. 296)

Chapter Three

Ayurvedic Research: Modernizing its Methods

As with the analysis of any case of institutionalization, we must consider how arrangements for achieving the prime goals – the improvement and diffusion of scientific knowledge – operate to induce or to reinforce motivations for contributing to the goals (Merton, 1973; 464). In this regard, while some have stressed the part played by advances in medical science⁴⁹, most (particularly historians) have, by contrast tended to stress the importance of reform, revival, humanitarianism and state intervention. The research role, which provides for the growth of scientific knowledge is so central to any field of medical knowledge that no discussion of formalization and institutionalization can be complete without it.

Institutionalization is more than a matter of changing values; it also involves their incorporation into authoritatively defined roles. The process of professionalization entails institutionalization because it has the consequence of including all Ayurvedic (physicians, research doctors and teachers) in a regular process of teaching, conducting research, and producing significant scientific work in the tradition of Ayurveda. This, in turn, encourages the building of a public image of an authoritative body of scientists. But this authority is based on demonstrated competence, and I will try to show how the practice of scientific journals in Ayurveda and the model of research systematized by them increases Ayurveda's chances of being more 'open' and 'public'.

There is a fundamental difference in the organization and practice of scientific research in the Ayurvedic medical tradition today. Something in the nature of an influence of the "ethos" of modern science (Merton, 1973; 268) can be discerned, even if only in a limited way. Ayurvedic research has picked up certain components of this ethos that have the potential of opening up the medical science of Ayurveda (and discussion on it) and developing its scientific achievements. The sample that I have drawn mainly consists of

⁴⁹ For modern medicine, doctors have generally emphasized the role of scientific advances per se, because scientific medicine has packed increasing curative power. Historians generally assign a greater role to reform

issues of the *Journal of Research in Ayurveda and Siddha*⁵⁰ - these issues have been selected in a decade-wise fashion so as to cover a broad range of research studies conducted in Ayurveda over a period of forty years. I have also found *Aryavaidyan* - the quarterly journal of the Arya Vaidya Sala (Kottakkal) - to be organized around a similar style of research, as I will be discussing. I have particularly focussed on the organization of research studies in these journals; the formulation of an experimental design, the adherence to protocol, and the significance of the controlled study.

Among the major causes of the decline of Ayurveda after the Brahmanic period (800 BC to 1000 AD), "a self-righteous feeling" that their practice reflects "ancient wisdom" and that everything that Ayurveda could contribute to medical science is already contained in the ancient texts – stand out as the most apparent reasons for a complacent attitude among men of Ayurveda to do further research (Sivarajan and Balachandran, 1994; 10). This faith has, over the centuries, taken away the spirit of questioning and experimentation from this medical tradition and has left little interest in the scope of further studies in the field. But as I will note in this chapter, the genesis of a scientific *fact* for modern Ayurvedic research follows a logic and pattern that is a change from how facts in Ayurveda used to be noted and communicated. This exercise also entails an examination of what constitutes scientific *proof* in the creation of such facts, and I will emphasize in this regard, the value of setting *standards* for the organization of research.

One of the things that I pointed out in the first chapter was the caution that we should exercise in denoting the term 'alternative' to Ayurveda, and I find it useful to reiterate here that the outcome of doing so would imply assigning to Ayurveda the status of an alternative to scientific medical practice itself, which it has never been.

movements to mark the development of medicine.

⁵⁰ The earliest editions of the journal were by the name of *The Journal of Research in Indian Medicine*, when it was published by the Postgraduate Institute of Indian Medicine, Banaras Hindu University. The earliest issue of this journal that I have referred to, is from the year 1969, but the format of research studies that I am describing have been institutionalized by the University ever since the journal's inception.

Scientific communication in modern Ayurveda

The *Charaka Samhita* is the oldest and one of the most important Ayurvedic treatises. It contains eight divisions (*ashtanga sthanas*) – *sutra, nidana, vimana, shariya, indriya, chikitsa, kalpa* and *siddha* – with each division being further subdivided into numerous chapters. It describes not only the existing knowledge about medicine in all aspects but also the logic and philosophy behind the Ayurvedic medical system. It offers elaborate description of various diseases including those of the eyes, and deals with subjects such as foetal generation and development, anatomy of the human body, function and malfunction which is contingent upon the equilibrium or otherwise of the three humors of the body – *kapha, pitta, vata* and it describes etiology, classification, pathology, diagnosis, treatment of various diseases and the science of rejuvenation on this basis. Since the time it was written, the *Samhita* has been edited and reconstructed only once, albeit, there have been several commentaries and translations into other languages⁵¹.

The *Sushruta Samhita* is the main source of knowledge about surgery in ancient India, and it describes a variety of surgical instruments and techniques of surgery. The techniques of dissection of the human body discussed in this treatise are unique, practical and revealing of the structure of the body (Jaggi, 1974; 273), though, what is striking (and instructive for our present purpose) is the near-total absence of corresponding diagrams or descriptions of these techniques.

Despite providing a comprehensive understanding of health and illness according to Ayurveda, and defining, in a sense, the subject matter of Ayurveda as a medical tradition, the classics contained little on prescriptions for diseases. In this direction, the *Nava Natika* carried Ayurveda into a new phase, where in addition to the *samhitas* on medicine and

surgery, compendia of prescriptions for various diseases began to appear (Jaggi, 1974; 274). Subsequently, several additions were made to the existing literature either in the form of commentaries on them or translations of them, and, in some cases, as a result of new drugs added and new surgical procedures tried. But the point worth noting is that all of these attempts were made by Ayurvedic physicians who were the medical authorities of their time⁵², and who, by using their knowledge and experience, made advances in the stock of knowledge that the *samhitas* and the later works created. Whether it was in the description of diseases or in procedures of diagnosis, significant advances were made, but by individual scientists. Discovery claims were, though not final, authoritative, and they did not require to go through the process of priority disputes and counterclaims before they were 'made public'. Discoveries were discrete acts of independent and individual Ayurvedic physicians that clearly did not make Ayurveda a collective activity.

The Central Council for Research in Ayurveda and Siddha (CCRAS)⁵³, wholly centrally financed, aids, develops and co-ordinates scientific research through a number of central & regional research institutes, regional research centres, clinical and drug research units. Its research activities include drug research, clinical research, health care or medicine research, literary research and research on indigenous contraceptive drugs. Among its activities, the most significant ones that have consequences for the research culture in Ayurveda are regular publications of all the research work that is undertaken under its aegis. This includes research activities published in the form of monographs and books as

⁵¹ The *Charaka Samhita* was translated from Sanskrit into Persian and Arabic in the beginning of the 8th century, and in 1897 it was translated into English by A. C Kaviratna. O. P Jaggi has given a very detailed account of the *samhitas* and their translations, commentaries and editions.

⁵² Right from Sushruta's time till about the middle of the 16th century, every major work in Ayurveda has been known as a treatise after the author - physician who has either commented or added on existing literature. Bhela (author of the *Bhela Samhita*), Vagbhata (*Ashtanga Samgraha* and *Ashtanga Hridaya*), Madhavakara (*Rug Vinishchaya*), Dalhana (*Nibandha Samgraha*), Chakrapanidatta (*Chikitsa-sara-samgraha*), Nagarjuna (*Rasa Ratnakara*), Sharangadhar (*Sharangadhar Paddhati*), and Bhava Misra (*Bhavaprakasha*).

⁵³ As part of the Central Government initiative to systematize study and research in Indian medicine, the Central Council of Indian Medicine (CCIM) is a statutory body that constituted under the Indian Medicine Central Council Act, 1970. It was reconstituted in 1984. It comprises The Central Council for Research in Unani Medicine (CCRUM) and the Central Council for Research in Yoga and Naturopathy (CCRYN). The Central Council for Research in Homeopathy (CCRH), also an apex body for research and education, is separate from the former because it is not counted as traditional Indian medicine.

well as journals and periodicals; namely, *The Bulletin of Medico-Ethno-Botanical Research*, *The Journal of Research in Ayurveda and Siddha*, and *The Bulletin of Indian Institute of the History of Medicine*. While the first two are quarterly periodicals, the third is a half-yearly journal, and all are published in both the Hindi and English languages.

There were a total of twenty monographs of clinical research studies that were published in the year 2001 alone and about thirty seven books and monographs as a result of literary research (as different from clinical research) studies (*Publication Catalogue*, CCRAS, 2001). In addition to these, drug research surveys and pharmacognostical and pharmacological studies are conducted, the findings of which are reported in medico-ethno-botanical journals or are monographed separately.

To conduct research and to publish or offer for publication the results of such research is to place the same in the public domain. It establishes the point that is indispensable to scientific research of any kind, and that is, the importance of information that can be made explicit.

Codification of scientific knowledge is certainly not new to the Ayurvedic medical tradition. If codification refers to the "consolidation of empirical knowledge into succinct and interdependent theoretical formulations" (Merton, 1973; 507), Ayurvedic texts in the 11th century AD and the 2nd century BC are the biggest examples. But it is the extent of codification that is important to the cognitive structures of a science (ibid., 507) because it affects the modes of gaining competence in it. Uptil now, experience has counted more for textualizing Ayurvedic knowledge, where description of facts have mainly derived from a physician's or surgeon's empirical particulars. In more codified fields, as Merton tells us, the criteria for assessing the importance of new problems, new data and newly proposed solutions are more clearly defined (ibid). And this itself should make for greater consensus

- among investigators in more codified fields - on the importance of new knowledge and the continuing relevance of the old.

Open disclosure of the procedures and results of research may be understood to be motivated by more than just the spirit of preservation of classical medical knowledge and authority. It suggests that there is a recognition of the potentially enduring character of a scientific journal, and of partaking in its proceedings. It is possible to ascribe to this trend a motivation that constitutes at its core the reward system in science (Merton, 1973; 279), which includes disclosure in exchange for institutionally guaranteed honorific property rights to the new knowledge given to others. Credit, responsibility and copyright become a familiar means of communicating reports and findings, particularly in the ones sponsored by a scientific society. This sort of motivation, I am arguing, is qualitatively different from earlier motives to contribute to the expansion of Ayurvedic knowledge, and it also makes for their public recognition as men of science, rather than just reformists or revivalists.

Irrespective of who conducts the research, reports, articles, monographs and books are required to follow a systematized pattern, a defined format - a *protocol*. Protocol refers to a definite and specific set of steps and stages in which to conduct and record research and it sets precise criteria to arrive at the results of research. Protocols have played an important part in the success of the co-ordinated research efforts during and after World War II: in the booming field of clinical research, the protocol was essential to ensure that the actions and interpretations of outcomes would be similar in all participating situations (Berg, 1997; 1081).

Standardizing the 'method'

One of the primary things that doing research by protocol entails and, in fact, enhances, is to reinforce the tendency to make explicit the steps involved in research. Clinical research

enquiry reports in the journals of Ayurveda that formed my sample, are classified and communicated in the particular order of:

A Conceptual Review;

Test Drugs;

Clinical Studies

Discussion; and

Conclusion

The first section of the study introduces the concept of the clinical condition that is the subject of investigation and offers a literary review of the anatomy and physiology of the part or organ that is affected by it. A discussion of the same is given by contrasting its understanding in the Ayurvedic classical texts with any changes that may have been incorporated in its explanation. Part two consists of a detailed description of the drugs under trial, that is, whose effect on the defined clinical condition constitutes the objective of the study. The third step comprises an explication of the *materials and methods* used in the study and the experimental control groups that participate in the research enquiry. The results of the former are discussed separately in the fourth and the fifth parts of the report, and it is this section mostly that contains graphical and tabular presentations of data.

Adhering to such protocol contributes to preventing the loss of important information that may come up as a result of the research process. Additionally, it depicts Ayurvedic medical research as a step-by-step cognitive process that uses stored traditional, professional knowledge to take the enterprise of research and innovation in the medical tradition forward. The reliance on guidelines or standards⁵⁴ that the use of protocol entails

⁵⁴ An important observation I made in the last chapter was that with regard to education, standards of professionalism have been set by modern medical institutions. It is possible for us to discern the same trend for the research aspect of the profession of Ayurveda as well, because standards first have to be institutionalized; scientists will work by them only once they are systematized and regulated by those institutions.

encourages the concept of a 'minimum set of resemblances'⁵⁵ in clinical research study reports. The idea of multi-centric trials in Ayurveda has been made possible because a minimum set of similarities and consensus on the component stages has been struck and strictly adhered to. The value of the concept of protocol to Ayurvedic medical research prevents it from being perceived and described as medical action that is independent and informal. And its contribution to innovation in the tradition of Ayurveda should be appreciated because it reduces the demerits of doing research in a manner as variable as the enterprise of research had been in the past.

It is not uncommon to hear of un-researched statements such as "holistic medicine has not yet established itself as scientific". The view that is expressed by H. S Berliner and J. W Salmon's in *The Holistic Alternative to Scientific Medicine: History and Analysis* echoes the widely held perception that research in holistic and traditional medicine is invariably about alternatives - an alternative mode of conducting research for an alternative answer to health and illness. Where causality is multiple or proximate, it is believed, no firm conclusions can be drawn that are generally acceptable within the scientific community.

The most rigorous test for the efficacy and scientific validity of a new treatment from the perspective of Western medicine involves the isolation and identification of a single, causal, physical relationship in a controlled, double-blind clinical or laboratory study. It is interesting to note that traditional medicine, especially Ayurveda has accepted the validity of this procedure. Modern Ayurvedic research no more exhibits an "anti-scientific tendency" as many scholars and lay people believe (McKee, 1988; 781). If we examine the mode of study and style of research in Ayurveda from the late 60s up to the present

⁵⁵ This is akin to Durkheim's observation of the role of "minimum essentials" in maintaining solidarity. To appreciate the role and concept of this 'minimum', see Emile Durkheim, *The Division of Labour in Society*, Translated by George Simpson (The Free Press, New York, Reprint Edition, 1947)

era, one will notice that Ayurveda is committed to the scientific testing of their methods actively, by falling back on the *controlled study*.

The test most convincing to scientific medicine is the controlled double-blind study, in which conditions are identical for experimental and control groups in all respects except for the administration of the experimental treatment, with neither experimenter nor subject aware of which group receives the treatment (ibid.). The central concepts that make this study are control and replication. To employ a control group design for evaluating diagnosis would mean randomly assigning patients to experimental and control groups, where 'therapies' to both the groups are administered by the same, neutral investigator (Aakster, 1986; 269).

Another key attribute of modern Ayurvedic research (and, indeed, of modern medical research in general) is the extensive participation of human subjects in its inquiries and experiments (Fox; 1998; 109). For modern medical research, the advent of new medical devices and radio-active materials have added a new dimension to the ethical issues that need to be considered before evaluating them for their efficacy, utility and safety (ICMR, Ethical Guidelines for Biomedical Research, 2000). The furtherance of medical knowledge and skill, most particularly, therapeutic innovation, involves a sequence of steps that must engage normal and healthy human subjects in specified ways because they are afflicted with medical conditions that concern the investigators. Human experimentation has increased in magnitude and complexity in Ayurvedic research, and it reaffirms the importance of applying the results of laboratory experiments to human beings to further scientific knowledge and to evolve effective treatments.

To describe a prototypical example of the manner in which research studies in Ayurveda employ the controlled study, the clinical study report on the effect of an indigenous drug on the treatment of Jaundice (*Kāmalā*) and Liver Disorders (*Yakrt Rogas*) could provide a

good case in point⁵⁶. A total of 212 patients⁵⁷ with four types of liver diseases, namely; Hepatocellular jaundice, Obstructive jaundice, Chronic hepatitis and Chronic cholecystitis were selected as the sample (Chaturvedi and Singh, 1988; *Introduction*). They are then divided into experimental and control groups – the first is treated with four types of Ayurvedic drugs (*Katuki, Kutakyadi-yoga, Kumari-asava and Daruhaaridra*) and the latter with modern drugs such as Prednisolone as control to compare the effects of the treated groups. The results of the study are finally assessed on the basis of the effects of the drugs on the signs, symptoms and liver function tests⁵⁸ of the patients before and after treatment, and by considering each disease as a single group.

Among the main requirements of this kind of a controlled study are emphasis on standardization, isolation, control, classification, quantification and randomization. The effects of the drugs classified at the beginning of the study are first noted individually on the two groups but are finally compared and contrasted in the light of test results prior to and after the drug treatment. Interestingly, the observation of results continued upto one to three years after the treatment had been stopped so as to follow the disease progression patterns in the two treated groups. Precise measurement is one of the chief components of controlled scientific research (Lele, 1986; xiii). R. D Lele points out that it should be mandatory to use the system of metric weights in Ayurveda. Modern Ayurvedic research recognizes the inadequacies in using the ancient system of standard weights in India that gave rise to marked discrepancies between the doses of Ayurvedic drugs in ancient textbooks and those in current practice. What all of this

⁵⁶ The choice of this study is absolutely random. But the fact that I had access to it in the form of a monograph (although it has also been published in an issue of the *Journal of Research in Ayurveda and Siddha*) was a bonus because it provided an unabridged and unabbreviated version of the study, and a lot of time has been spent on explaining the study design. The study is the result of the joint research effort of two Ayurvedic research doctors and teachers from the Institute of Medical Sciences, B.H.U and Institute of P.G.T.R, Gujarat Ayurveda University – Prof. G.N Chaturvedi and Dr. Gurdip Singh, respectively.

⁵⁷ The patients for this study were referred from the *Kayachikitsa* (Ayurvedic medicine) Out-Patients Department of Sir Sunderlal Hospital, Banaras Hindu University, who were registered for the study irrespective of their age, sex, occupation and social status.

⁵⁸ The tests that were performed were all 'modern' tests for the diagnosis of liver disorders – serum bilirubin, Van den Bergh reaction, Thymol turbidity, serum albumin, urinary bilirubin, faecal stercobilin and total serum protein.

reiterates is not only the value of doubt and question, but it also goes to show that there is no belief of 'eternity' attached to any result, and there certainly is no 'final' result (Subbaram, 1998; 2).

"In the light of modern thought and investigation, much of what was once taken for granted is declared to be in need of demonstration and proof. The criteria of proof themselves have become objects of dispute" (Louis Wirth in Mannheim, 1929; xiii).

Medical sociology has believed that for holistic medicine in general, and Ayurvedic medicine in particular, classification is not a good thing. One who isolates destroys the whole and classifying as such destroys uniqueness (Aakster, 270). But for scientific investigation, especially in its early stages, any classification is better than no classification (Henderson, 1970). The concept of classification is not new to Ayurveda – the materia medica of the Charaka Samhita consists chiefly of vegetable products, though animal products are also included in it, and all drugs are classified into a total of fifty groups on the basis of their action on the body. The pattern which is typically followed (especially in the Charaka Samhita and its interpretations) is a symposium like format in which a practical problem like fever (*jvara*) or dysentery (*atisara*) or pulmonary Tuberculosis (*rajayakshana*) is discussed, classified as to type, contextualized (with respect to prodrome, syndrome and prognosis) and finally, dealt with therapeutically.

The introduction of the controlled study has, however, sometimes been an indication of 'alternative therapies' as "newly emerging from their counterculture" (Novey; 2000; 8). The creation of properly designed and controlled studies is a learned skill that requires the same degree of rigorous thinking for Ayurvedic research as for their 'modern' counterparts. It requires interacting with concepts of modern science, and to an extent, with modern medicine, and suggests a professional self-image that allows research

doctors and practitioners of Ayurveda to apply study criteria other than those hitherto used in their tradition.

Documenting the results of research, in addition to 'opening up' a scientific tradition, serves also to minimize the number of interpretations possible. Graphs, tables, diagrams and charts not only make research findings more intelligible, they also limit the room for speculation on what the researcher may have meant by the use of a certain terminology or procedure⁵⁹. Though classical Ayurveda, both Charaka and Sushruta placed emphasis on direct observation, but their texts (and even later commentaries on them) have no anatomical or surgical illustrations. Dominik Wujastyk, in his paper titled 'Interpreting the image of the human body in pre-modern India'⁶⁰ (Wujastyk, 2001; 18) notes that most Ayurvedic manuscripts that he has studied have been empty of accompanying illustrative materials⁶¹. There are small sketches of chemical apparatuses in some alchemical manuscripts, notably those of the *Rasendramayngala* and some of the *Rasaratnākara* (ibid, p. 18), but these are in small measure, with sketches of the body even more absent. It is difficult to see how such techniques such as rhinoplasty could have persisted purely textually (Thakur, 2001; 17).

Looking back, critically: The self-reflexive nature of modern Ayurvedic research

It is the tendency of "critical self-clarification" (Mannheim; 1929; 41) that makes modern Ayurvedic research different. Well-designed studies such as the one described above, documents the effectiveness of any new or different therapy before adding it to their therapeutic repertoire, and it is this that goes to constitute 'evidence' in Ayurveda today.

The medical knowledge base of Ayurveda even in its most classical, ancient, traditional

⁵⁹ There are a total of 120 tables depicting averages, means and statistical aggregates of effects, causes, signs and symptoms of treatment in the case study that I have cited.

⁶⁰ The full article can be viewed at : <http://www.ucl.ac.uk/~ucgadkw/papers/tarabout-full.pdf>

⁶¹ Wujastyk makes a case for a certain Sanskrit manuscript that contains an anatomic illustration of the eighteenth century Ayurvedic body. He makes the observation that among the thousands of Sanskrit manuscripts that he has studied, he has never seen another image that even approaches it in theme or treatment. No single manuscript, he argues, contains even so much as an anatomical sketch, a line drawing for surgical guidance, or any other visual representation of the medical body.

form is not a product of god's word. It is a medical treatise constituted by empirical and philosophical statements which were generated as a medical response to health and illness, albeit, the procedure in which these statements were produced and recorded were different. For a long time, confidence was vested in the *producer* of these statements, and Ayurvedic knowledge, for all practical purposes, existed in the 'authoritarian mode' (Wallace, 1971; 11). More strengths than weaknesses of the 'learned medicine' of antiquity were taught to generations of those who could afford it⁶², particularly the versions of Charaka and Sushruta, on whose authority it lent so heavily.

With commentaries and interpretations of the classics growing with time, families of physicians and, sometimes, independent physicians began to use this empirical and conceptual base to experiment with Ayurvedic therapies on their patients, but which failed to expand the knowledge base of Ayurveda as such because very few of these advances and experiments were actually documented. Ayurveda gradually grew a pattern of reliance upon anecdotal evidence, with 'proof' of efficacy to be found only in "individual testimony" (McKee, 1988; 781).

When scientific proof combines a primary reliance on the observational effects of empirical statements, with a secondary reliance on the procedures used to generate them, it is said to form the 'scientific mode'⁶³ of generating and testing statements (Wallace, 1971; 13). The inclusion of modern science models and the practice of scientific writing in Ayurvedic research has taken it from discrete, individual contexts to a community of experts and lay.

⁶² The social structure was prohibitively selective of what kind of person (by sex, strata, etc.) could learn Ayurvedic medicine.

⁶³ On the other end of the spectrum are those who explicitly disavow scientific explanations and attribute their achievements to non-material factors such as religious faith, supernatural entities, magical rites or antiquity and tradition.

Research studies that are not innovative in the sense of being 'discovery' oriented, are conducted with the objective of critically revisiting traditional Ayurvedic cures. Modern methods in pharmacodynamics provide good information on what the drug does to the body and vice versa. Such drug research studies offer important conclusions on how to maximize therapy and minimize hazards of commonly used Ayurvedic drugs and formulations. Sometimes there is no idea of the maximally tolerated human or animal doses of common Ayurvedic drugs. A recent study done on healthy volunteers documented by R.D Lele, scientifically establishes the tolerability of *Yogarajaguggulu* – a formulation used by people without the formal prescription of a physician – and concludes that with high doses, side effects are evident (Lele, 1986, .xvii).

The first problem for documenting research is, of course, to get enough work of merit for publication. For Ayurveda, the problem was mostly because of the authority that the classical works held in the medical tradition, which resulted in turn, in the small number of scientific research studies that doubted or critically examined concepts and norms laid down in the former. But it was also in part caused by the premium upon secrecy – an attitude mostly reflected by families of physicians who ensured that discoveries in terms of cures and treatments were intra or inter-generationally mobile, as long as they stayed within the family⁶⁴. Production, transformation, criticism and dissemination of new knowledge in the sense in which is taking place now, has nearly been absent. This is a traditional element that is ostensibly pre-modern and incongruous with the *normative structure of science* (Merton, 1973; 267). The retention of results of research that have arisen accidentally or through planned research not only impedes the full development of research but also refuses to recognize other experts in the same profession.

⁶⁴ This is why it is possible for us to hear of particular families in selected regions that have mastered the 'cure' to specific diseases. The knowledge of the treatment is passed down to successive generations and they maintain the family tradition in successfully treating those diseases.

As part of his attempt to discover exactly how science 'works', Bruno Latour, in his interpretation of scientists' actions, observed that scientists spent a great deal of time in writing technical papers (Latour, 1987). These papers, he asserts, can usually be decomposed into a dense tangle of references, citations and figures that together go to constitute the necessary defense against those who would question the legitimacy of its assumptions and findings and figures, in particular, serve a purpose of connecting the scientists to the laboratory.

Scientific methods deliberately and systematically seek to annihilate the individual scientist's standpoint (Wallace, 1971; 14). Data published in scientific journals make such a knowledge claim that is legitimated by making explicit the established methods, materials and procedures, where any subjective element (characteristics of the author and the social nature of science), are ideally eliminated. When the source of information and the process of arriving at conclusions is made known, an important outcome is the possibility of evaluation of scientific works, both by the scientific community of scientists in Ayurveda and other allied fields, and by the lay person. Scientific work, in particular, acquires new significance for the rest of the society, and medical practitioners gain respect as they are progressively more successful in applying scientific knowledge to alleviate individual suffering (Leslie; 1998; 320).

One may be tempted to view this as an outcome of the internationalism in the production of biotechnologies, but the transformation of a research culture is not necessarily a result of the 'bioscience underpinning' (De Good, 1995; 469) to ways of conducting research. Rapid innovation in the biosciences is recorded daily in biomedical journals and in the popular media. Articles and journals that herald such innovations as advances (in molecular biology or molecular genetics, for instance) are articulated in a manner as if they "transform the theory and practice of medicine". The role of pharmaceutical and biotechnical corporations in sponsoring biomedical research in academic institutions in

Europe, the US and Japan has been well-documented, and the reporting of bioscientific innovations illustrate how cultural centres of medical standard-making (for instance, medical specialty societies, institutions of academic and research medicine both public and private, as well as pharmaceuticals and biotechnical corporations) are launched to reframe the culture of the clinic in biomedical research⁶⁵.

The very character of the medical system of Ayurveda, which derives itself from a textual, scholarly tradition, reflects that once a new scientific finding has been accepted and thus crystallized in the conceptual order, it does not necessarily *replace* concepts in the classical texts, but expands its formal medical knowledge base. In Kuhn's language, it is work that is "within the tradition of normal science" that emerges from a "cumulative process, one achieved by an articulation or extension of the paradigm" (Kuhn, 1962; 85). But what has not hitherto been part of this paradigm is the nature and scope of Ayurvedic research itself. As much recent work in Ayurvedic science and medicine has demonstrated, the character of medical research in Ayurveda has transformed from an *ad hoc* to a formal way of organizing research work. And while literature on the subject of contribution of classical Ayurveda to medical science is sizeable, accounts of advances of modern medical research in Ayurveda is either sparse or non-existent.

What I have tried to argue so far is that standards of research have altered. Social scientists in general tend to be critical of the use of modern science models for traditional medicine, which, in their opinion, is a *different* science that is capable of – and indeed should be – using its own methodology. Whatever else it may be, science is a way of generating and testing the truth of statements about events in the world of human

⁶⁵ This was an account of the culture of biomedical research creating and reframing the culture of the clinic. In November of 1993, the American Medical Association (AMA) and its affiliated journals published a series of articles on molecular biology and molecular physics. This particular account was by a *New York Times* science writer, Gina Kolata, who also quoted the editor of *The Journal of the American Medical Association* as stating the barrage of inventions in molecular biology as "an explosion, a culmination, a profound statement of the importance of this subject for the human condition". The *rhetoric* of discovery in scientific research in the biomedical sciences have now become an inextricable part of the discovery process in biomedicine.

experience (Wallace, 1971; 11). Ayurveda research has been able to show that it can conventionalize criticism of statements once believed to be authoritative, and in doing so, it has emphasized the role of methods in the scientific mode. And what comes across strikingly is that it has regularized scientific communication.

The meaning given to the word science is also entangled with the problem of periodisation – the arrangement in chronological order of scientific activities and events with certain great periods of identifiable phases (Paty, 1999; 184). We can sketch out a rough succession of periods for the sciences as a whole by defining the reference time sequence for modern, traditional and contemporary science, with sciences of antiquity mostly omitted. By modern science models then, I have suggested basically three trends: one, the incorporation of the idea of 'standards' and protocol in Ayurvedic research communication; two, the process of experimentation and research through the constitution of institutions, and three, the conception of Ayurvedic science as a collective activity, accompanied by the idea of advancement of knowledge by accumulation.

Ultimately, it boils down to a question of motives – reform centered around tradition and revival or tradition, innovation and revival? The kind of motivation that one can discern in the type of methodology applied in modern Ayurvedic research is sometimes to the detriment of the Ayurvedic movement in its narrowly understood 'revivalistic' sense, but is not detrimental to the history of its concepts. A lot of the drug research and clinical research studies that I have examined are motivated by a felt-need to address the inadequacies and inabilities of modern medicine (and their toxic long-term effects on the body) in curing illness. We require sociological and anthropological attention to the ongoing practice of Ayurvedic research in the country to enhance both our understanding of the sociology of scientific knowledge and our appraisal of what it means to 'modernize' a traditional way of doing research.

Printing provided a technological basis for the emergence of that component of the ethos of science which has been described as "communism of knowledge" (Merton, 1973; 464) – the norm that prescribes the open communication of findings to other scientists and that correlatively proscribes secrecy. Illustrations of the Ayurvedic body began to appear in print from the late nineteenth century. These evidenced the beginnings of a more widespread indigenous attempt at anatomical illustration (Wujastyk, 2001; 22), and of a more systematic effort in detailing the assumptions, processes and results of Ayurvedic research. But, this norm could not have fully developed in response to the technology of printing alone⁶⁶ – rather, one should look for a change in the nature of motivation, that, from motivated secrecy has transformed to motivated disclosure.

Some scholars understand it as the most compelling example of conventional medicine imposing its method of scientific proof on alternative medicine, "even without a willingness to seriously discuss alternative methods" (Aakster, 270). But the question that I have tried to raise is not whether this type of testing is the only valid way of arriving at true propositions or not, but that it will suffice for us to take notice of the fact that modern research in Ayurveda recognizes that there are certain requirements for the method of establishing scientific proof and that will contribute to making Ayurveda a scientific medical endeavour where advances are made by applying extensive, detailed and empirical cognitive knowledge in addition to the stock of knowledge of classical texts. This manner of the organization of scientific inquiry and the internalization of an 'institutionalized pattern of evaluation of science' (Merton, 1973, 460) itself demystifies the image of Ayurvedic science as one that is aimed at an 'absolute' or 'final' knowledge of any kind.

In addition to the stated observations, I want to underline that the trends in Ayurvedic teaching and research discussed so far, can easily be misconstrued as an example of the

⁶⁶ The earliest works of Ayurveda were printed, but secrecy is a matter of attitude.

organization of the teaching, practice and research of biomedicine in its 'local' context. Social and cultural studies of biomedicine aim at understanding the entire domain of the research and clinical culture of contemporary biomedicine (Good, 1995, 461), and in doing so, tend to explain the world of local medicine as an expression of the cosmopolitan biomedical.⁶⁷ These local worlds are not biomedical versions of indigenous healing traditions. They are the result of a self-conscious effort on the part of the Ayurvedic scientific community to prove and confirm what has been elaborated upon in the classics. It is a patterned, systematic way of consolidating independent research studies in Ayurveda and inculcating the spirit of science as a collective enterprise that involves not only the science fraternity but the public as important consumers of science.

⁶⁷ The tendency that I am referring to is what Mary-Jo Good's article is premised upon. In her essay, she focuses on the dynamics, tensions and exchanges between the local and global worlds in medicine, with an investigation of the political economies of biotechnology and the biosciences. My point about bringing this up here is to clarify that my analysis of the incorporation of models (that have been used to develop modern science) into Ayurvedic research and teaching is not a good example of such local and global exchanges, and does, in no case, suggest a political economy inquiry into how the cosmopolitan can erode the 'local'.

Chapter Four

Collaborative Research: An Experiment in Dialogue

"Whatever the cause, retreat from dialogue is a retreat from reason".

- J. Wilkinson⁶⁸

Although much past and current sociological research has concentrated on the problem of contestation and struggle between the western and Ayurvedic systems of medicine, very little material has been obtained from the zone of interaction between the two. In accounting for progress in the Ayurvedic medical tradition, I have so far engaged in understanding the concept of 'expertness' in the profession of Ayurveda and the qualitative change in the nature of modern medical research in Ayurveda. It is worth examining then, how the above can have the result of enhancing Ayurveda's capacity to enter into a dialogue with other branches of knowledge, most notably, with the biomedical tradition of medical knowledge, which is its 'incommensurable'⁶⁹ other. In this regard, I am particularly concerned with the understanding of the two systems of medicine as 'paradigms', of our idea of 'progress' of these paradigms as has been shaped by familiar past theories in the sociology of science, and how experimenting with dialogue between them is not the same as efforts to 'integrate' or 'synthesize' the two.

Past efforts to reconcile the Ayurvedic with its 'Other'

One of the most basic flaws in formulating project plans on integrating modern and traditional medicine in India is that 'discovery' is assumed to be modern and ancient science's contribution is limited to 'insights' and 'wisdom' and 'thought'. A national symposium organized by the Bharati Vidya Bhavan in 1978, titled *Ancient Insights and Modern Discoveries*, is a case in point. Put succinctly by Dr. Ashok B. Vaidya (Vice

⁶⁸ In his essay on the civilization of dialogue, Wilkinson makes a case for action based on reason. Quote borrowed from Janet D. Allan and Beverly A. Hall's 'Challenging the focus on technology: A critique of the medical model in a changing health care system' available at www2.plattsburgh.edu/acadvp/libinfo/library/er/nur350r13.pdf. For more on the culture and conditions of 'dialogue', see J. Wilkinson *The Civilization of the Dialogue* (Centre for the Study of Democratic Institutions, California, 1968)

⁶⁹ Kuhn makes use of this word to stress the incompatibility of two paradigms - the new and the old paradigms, in particular, and suggests that conflict cannot be resolved by recourse to the tenets of the paradigms because they are necessarily "incommensurable".

Chairman, Life and Health Sciences Division, Bharati Vidya Bhavan), the main concern of the seminar was to "build a bridge" in "diverse aspects of linking Ayurveda and modern biomedicine". That discovery is a major component of medical research in Ayurveda today – though the *context* of discovery and justification may not be the same as for biomedicine – is not recognized as a premise for integrative plans that usually merely ascribe the benefits of a traditional medical system to the wisdom of the past, to a thing that has been achieved once and for all.

The Committee on Indigenous Systems of Medicine, 1948, formulated an elaborate systematic plan for the integration of the western and Ayurvedic medical systems with the hope that it would ultimately result in a 'synthesis'. The opinion in favour of integration was translated into a series of recommended steps that primarily focussed on an integration of the course of studies "by arranging the curricula in such a way that whatever is weak in one system is supplemented and strengthened by the strong points of the other" (*Report of the Committee*, 1948; Vol. I, 188). The Report echoed what were to be the major concerns of one section of the professionalizing Ayurvedists, who opposed a 'purist' approach to the modernization of traditional medicine⁷⁰ and encouraged a conception of education with increased theoretical and working knowledge of not only modern medicine but basic modern sciences such as chemistry, biology and physics as well. "There are no two opinions about the value of incorporating some of the modern sciences in Ayurveda.....the need for incorporation and co-ordination has been accepted by Charaka.....many basic sciences which were developed independently...have been incorporated" in classical literature (*Report of the Committee*, 1948; Vol. II, Appendix C, 497).

⁷⁰ The debate between purists and integrationists in the history of making Ayurveda a profession is well known and not only have the professionalizing Vaidyas, but historians and academics on Ayurveda have also made this preference for either a synthesis or a "pure" Ayurveda amply clear.

The impetus contributed to initiating something in the nature of an integration, but the idea was to allow the student of Ayurveda a knowledge that was "unified.... and imbued with the spirit of the ancient Indian medicine and well equipped with modern science" (*Report of the Committee*, 1948; Vol. I, 188). The division of labour was clear – while subjects in modern science and medicine would look after the 'progressive' needs of modernizing Ayurvedic medicine, the principles of Ayurveda itself existed to retain the "spirit" of ancient Indian medicine.

Integrative plans of this kind rarely led to any real dialogue between the Ayurvedic and other - particularly the western - system of medicine. A departure from this approach came with a new trend in textual research in Ayurveda that hoped to initiate some kind of interaction between the two by interpreting Ayurveda in modern science language. The intention was clearly to view and understand Ayurveda "through modern eyes" (Lele, 1986; Ch.1), to rechristen in terms that were familiar, and, it was hoped, acceptable to modern science. K. N Udupa⁷¹, a prominent Ayurveda expert, attempted, for instance, to validate the *Tridosha*⁷² theory and categorize its principles, concepts and assumptions on the basis of neurohumoral transmitters – a category that was "close to" modern concepts (Udupa, 1985; 2). Works such as these were, evidently, eager to show that Ayurveda could, in fact, serve as a practical frame of reference for modern medicine. R. D Lele's *Ayurveda and Modern Medicine*, as another example of this trend, selects aphorisms from Ayurveda akin to the aphorisms of Hippocrates and attempts to cover the diverse aspects of modern medicine and basic science in relation to these aphorisms. The result has been a sizable literature that sees the need to "build bridges of communication and co-

⁷¹ K. N Udupa was one of the more significant people who played a prominent role in the professionalization of Ayurveda. He was a highly qualified Vaidya, taught at the Post Graduate Institute of Indian Medicine, Banaras Hindu University, and was the chief Editor of *The Journal of Research in Indian Medicine* for many years.

⁷² In Ayurveda, the *Tridosha* is a theory of pervasive humoral balance and basic human constitution comprises *vāta* (wind), *pitta* (bile) and *kapha* (phlegm). In turn, these humors are derived from the five elemental forms of matter known as *panchbhūta* (earth, water, fire, air and ether). They exist not in isolation but in only in combination.

operation across chasms of polarity of views and attitudes” in a culture where there are “too many walls” (Lele, 1986; x).

This did, indeed, bring about some changes in the *discursive space*, but it failed to create the pre-requisites of a dialogue between Ayurvedic and western medicine. The development that I consider as marking a significant step in creating the conditions of an active interaction process – a dialogue – is a recent one, and it can be said to arise out of the practice of ‘collaborative research’ in medicine.

Collaboration: a new zone of interaction

By collaborative, I am referring to “joint scientific efforts” (ICMR’s Initiatives in Traditional Medicine, ICMR Draft, 3) that are based on the value attributed to the use of distinctive knowledge traditions for the purpose of scientific inquiry into medicine. The medical solutions in Ayurveda being plant-based, drug research and discovery forms an integral part of the substantive field in Ayurvedic research. A considerable proportion of development projects in medicine⁷³ in India today relies on research that is collaborative in character, drawing upon the medical knowledge base of scientists trained in two distinct traditions of medical thought - the Ayurvedic and the biomedical. As separate styles of constructing the body and of explaining disease in it, the two medical systems are clearly separate paradigms that differ in what they consider to be legitimate scientific problems and methods of inquiry, and are, to use the Fleckian formulation, different ‘thought styles’.

Interest in such research has found expression in ICMR’s research initiatives over the past few years. The Composite Drug Research Scheme (CDRS) during 1964-1970 “brought together for the first time, experts in the Ayurvedic system of medicine and modern medical experts (pharmacologists and clinicians) and scientists (botanists and

⁷³ I must say at the very outset that collaborative research should not be held to be the typical mode of research in the country, but I think that the fact that more and more research projects at the CCRAS, the ICMR and Dabur Research Foundation are organized as such, makes it a point worth insisting upon.

phytochemists) for selecting and screening Indian medicinal plants for biological activity on the basis of their therapeutic claims" (ibid, 1). After the establishment of the Central Council for Research in Indian Medicine and Homeopathy (CCRIMH) and its branching into independent councils including the Central Council for Research in Ayurveda and Siddha (CCRAS), this scheme was transferred to the latter, which has, in fact, institutionalized the preference for undertaking research projects in collaboration. The distinguishing feature of such projects is the primary aim to identify and exploit the functional linkages between Ayurveda and modern medicine that offer potential for well-planned medical research, and to use the expert knowledge of scientists from different organizations representing different traditions of medical and scientific knowledge.

The recently published compendium of twenty-nine research studies (Select Research Papers, 2001) on certain chosen aspects of drug research in Ayurveda is a result of collaborative studies conducted by research doctors and scientists from the Central Council of Research in Ayurveda and Siddha (CCRAS), Banaras Hindu University (BHU), Indian Council of Medical Research (ICMR), All-Indian Institute of Medical Sciences (AIIMS), Defence Institute of Physiology and Allied sciences and several Post-graduate colleges of Ayurveda across the country. The areas of research have been 'Neuroactive Drugs', 'Immunomodulators and Adaptogens', 'Anti-Arthritic Drugs', 'Hypolipidaemic Agents', 'Ksharsutra' and 'General Pharmacological Actions of Medicinal Plants'. The two distinguishing features of such studies, in addition to relying on the knowledge base of scientists trained in different traditions of knowledge, is, one, that the effort is multi-centric, and, two, that they culminate in multi or co-authored articles.

That there are major problems in a 'synthesis' of paradigms, is an accepted fact. But we need to note that integrative plans hitherto have been motivated by the idea of synthesis, not collaboration. While the former implies a hybrid, a syncretism, the concept of collaboration must not be used synonymously. I will therefore, in the remaining part of this

chapter, explore the problems that different medical models and paradigms pose for the idea of collaboration and suggest that the fact that these paradigms have been bereft of dialogue and reason for so long implies the complete absence of an *ideal speech situation*⁷⁴ (Habermas, 1985) across paradigms. Collaborative research addresses this failure in the approach of the 'integrationists' and relies on expert medical knowledge of two traditions, preserves the distinctiveness of paradigms, and makes progress conceivable without involving paradigm shifts.

Paradigms of medical thought

The idea of the impossibility of any dialogue between two paradigms of medical knowledge has such tremendous appeal for those who intend to defend their own paradigms, that even indicating that a failure of collaboration is a failure of dialogue, is to take somewhat of a risk. But what makes the mental and formal conceptualization of collaborative research problematic? I will try to examine this in some detail, and I am submitting two reasons for it to be so: first, the domain assumptions on which the Ayurvedic and biomedical traditions rest; and, two, our idea of 'progress' as shaped by past theories in the sociology of science.

As separate styles of constructing the body and of explaining disease in it, the two medical systems differ not only in their disease etiologies, diagnosis and methods of inquiry, but also in what they consider to be legitimate scientific problems. If western medicine rests on assumptions and procedures that emphasize 'specialization' (Udupa, 1985; 1), that is, dealing with diseases of particular organs and tissues, Ayurvedic medicine begins on the premise that a "healthy person" is one who possesses "balanced *doshas* (humors), balanced *agni* (hormones) and a harmonious functioning of body

⁷⁴ Although, as I will explain later, collaborative research is not an appropriate example of an ideal speech situation in the exact sense that Habermas had meant it, but it does signal some kind of a communicative action beyond and across paradigms. To know more about this concept, read Jürgen Habermas, *The Theory of Communicative Action: Reason and Rationalization of Society*, Vol. I (Beacon Press, Reprint Edition, April 1985).

tissues.....and an enlightened state of consciousness, sense organs and mind” (Udupa quotes Sushruta, 1985, 1). Unlike in western medicine, disease, in the Ayurvedic scheme of things, is wholly understood and studied in relation to the body constitution of a person (ibid. 2), his/her physical as well as mental make-up. Presented as such, Ayurveda offers what we can call a ‘competing’ paradigm. The points that make up the critique of the bioreductionism of western medicine then emerge as the following: mind and body as separate; disease as a separate entity; and doctor as expert.

According to biomedical thinking, deriving from Descartes’ thesis which treats mind and body as completely separate, non-physical factors in illness can be excluded and treatment is based on rational and objective observation and evaluation without subjective influence. The Ayurvedic approach stresses the context, the relative nature of illness, and the subjective nature of it as paramount. While in the former, disease is the cause of illness, and the cause of disease may be physical, bacterial, viral, congenital etc., and all causes of a particular disease are identical, their etiology based on universal laws, the *doshas* in the Ayurvedic model are not visible or measurable, but they are substances that give the body both structure and function, and are associated with different parts of the body and body processes. Each individual possesses a “natural” constitution of these *doshas* and health is brought about by a combination of a state of equilibrium of these.

Following this kind of an explanation for the pathogenesis of diseases, Ayurveda gives greater importance to heredity or hereditary factors than does western medical science (Udupa, 1979; 319). Persons with a *váta* constitution, for instance, on exposure to stress are liable to produce acetylcholine and are, therefore, more prone to develop diseases like peptic ulcer. Those with a *pitta* constitution are more likely to develop asthma and ulcerative colitis under stress (ibid.). These, Ayurveda believes, are genetic susceptibilities inherited by each individual from his/her previous generation, while for modern science, only certain diseases are inherited. And while hormonal deficiencies are generally treated

by replacement therapy from exogenous sources, in Ayurveda, hormonal deficiencies are overcome by the administration of drugs that promote the endogenous production of hormones.

Advocates against collaboration point out that the two are so fundamentally distinct in their conception of the 'medical body' that any idea of a joint research effort should be viewed with caution. The chief locus for knowledge of the medical body is the literature of classical medicine, *Ayurveda*. In an interesting study of this literature from the point of view of body-knowledge, Zimmermann (1983) addresses two points particularly: the epistemological position of anatomical knowledge, and the images underlying the doctrine of the humors. One of the central claims that Zimmermann makes in this study is that there is no "real" anatomy in the Ayurvedic literature. By "real", Zimmermann means that those parts of the body which modern medicine calls organs and views as small factories or machines for manufacturing or transforming nutrients etc., and which may be enumerated, dissected, and so forth, are not, in Ayurveda, viewed in the same way at all (Wujastyk, 2001; 17). Rather, the humors are vital fluids, and the frame of the body is a network of channels through which vital fluids must be kept flowing in the right direction⁷⁵ (ibid.).

Additionally, the points that constitute the critique of the bioreductionism of western medicine and that are forwarded to construct an argument against collaboration between the two systems extend beyond the purely theoretical to the methodological limitations of applying modern science models to Ayurvedic research. The appropriateness of the method of protocol is regularly suspect because Ayurvedic medicine and therapy is individualistic and person-centric, premised on the assumption that different people will

⁷⁵ But, from his detailed study of representations of the medical body in certain ancient texts, Wujastyk concludes that close examination of figures confirms that the medical body is not always surrounded by *chakras* and the universe in miniature. Images are portrayed as "completely medical", where though the organs are not, by and large, engaged in the kind of processing which modern biomedicine expects of an "organ", they are nevertheless clearly and substantially understood as repositories for biological substance.

have different mechanisms of action despite being exposed to the same drug. Holistic treatment is directed at the person and not the disease, and it is, ideally, adjusted for the unique needs of each patient. The very idea of slotting patients into 'groups' is anathema to Ayurvedic medicine, which treats and cures in a particularistic idiom. The protocol is clearly not linked to this idea: the most evident shortcoming of the protocol is that it contributes to the possibility of a single answer, an optimal solution for all persons expressing the same symptoms (Berg, 1997; 1083). It promotes the illusion of a single response from (and effect on) all patients to an Ayurvedic intervention irrespective of the constitution and temperament of the individual receiving treatment, which, in fact, forms the basis of disease conception and treatment in Ayurveda.

I have observed in the previous chapter that the use of protocol as an instrument that embodies a single rationale has helped the cause of modernizing research methods in Ayurvedic medicine. But we ought to recognize that the concept of protocol or controlled trials may not hold the same promises for clinical practice⁷⁶ in Ayurvedic medicine as for laboratory research. Comparability and repetition of findings is highly problematic for holistic therapies since they usually are designed to treat the individual rather than the disease (McKee, 1988; 781). Treatments, therefore, are specialized for each patient, rather than standardized to treat a hypothesized 'disease entity'.

It is important that we understand these differences between paradigms as not merely of *emphasis*, but as basic and absolute. The idea of collaboration between two systems of medical thought is not to suggest that it is made possible because there are more similarities in the two medical traditions than meets the eye. R. D Lele, for instance, has focussed a great deal of attention on highlighting the ways that reflect a similarity of

⁷⁶ For medical practice, the term implies "practice policies" or "algorithms" or a set of instructions telling medical personnel to do a particular thing in a particular situation. David Eddy, in his series of articles in the *Journal of the American Medical Association* has given the label 'practice policies' to the use of protocols in medical work and he notes that the creation of these guidelines or policies has become big business in America. For Ayurvedic medical practice, protocol, by its very definition, is limiting.

approaches between the two. Medical sociologists⁷⁷ who argue that the reality of medical pluralism is only illusory and whatever differences exist between orthodox and non-orthodox medicines are at the level of political and economic aspects - not because of any ontological distinctiveness - would subscribe to this view. I am arguing, however, that the two prominent systems of medical thought in the Indian medical pluralist situation are different and it is this difference that makes a medical encounter in collaboration, and not in 'integration' or 'synthesis', possible.

Some medical anthropologists have produced detailed analyses of the philosophy of 'health' in Ayurveda and argued that its fundamentals are so beyond the concept of remedial action, that it becomes impossible to explain Ayurveda as playing the role of a paradigm that can compete with the biomedical model. Joseph Alter, in a pertinent study on the ontology of 'good health' in Ayurveda, re-examines the meaning of embodied health by looking at Ayurvedic medicine "not as a means of curing disease and restoring balance, but as a mode of radical self-improvement" (Alter, 1999; S 44). A state of good health in Ayurveda emphasizes the moral responsibility of the person in abiding by a daily regimen that promotes balanced fitness, and in struggling for a mode of metabolic and humoral body-building that would result in not only a physical, but a 'metaphysical' fitness.

The 'remedial bias' of western medicine (ibid., S 45), it is further noted, is opposed to the realm of possibility beyond good health that can be brought about by curing disease – a realm of optimal, maximally increasing, unlimited health promotion that Ayurveda recognizes. Ayurveda, according to this view, is an applied philosophy of physiology that does not believe in the automatic restoration of health as an outcome of the curing of a specific ailment. For the Ayurvedic model, keeping well then becomes chiefly a matter of

⁷⁷ Gil-Soo Han, in a paper titled 'The myth of medical pluralism: A critical realist perspective' begins his paper by pointing out the "assumption" that there is a high level of medical pluralism in contemporary society. The difference between medical systems, he says, is only contextual. For more on a critical realist approach to understanding the existence of more than one system of medicine in contemporary society, view Han's article on <http://www.socresonline.org.uk/6/4/han.html>

leading a balanced, regular, moderate life that enables the person to strive for a state of mundane happiness and an elevated state of spiritual attainment.

While the above are important, no doubt, in achieving health, they form a part of the medical solution that Ayurveda aims and seeks to provide. Undermining the remedial achievements of the Ayurvedic medical system by arguing that it would reduce Ayurveda to an "indigenous form of remedial, allopathic medicine" that provides a "natural alternative to biomedicine" (Alter, 1999; S 58) is to believe that Ayurveda's major contributions have been moral, philosophical and spiritual. Such a view, admittedly, fails to offer Ayurveda the status of a competing paradigm to western medicine, thereby denying the possibility of any interaction of the two on epistemically equal terms, which is what research in collaboration is premised upon.

It would be useful then, to emphasize that the discursive space between the Ayurvedic and western models of medical thinking that is created by collaborative research, has been enabled by the professionalization process in Ayurveda and the orientation of modern medical research in Ayurveda, and in this regard, I will try to extend the argument that I developed in the previous chapters. I will note particularly two developments: one, how the organization of modern medical research helps Ayurveda to strike a minimum set of resemblances on which to base an active interaction with western medicine; and, two, rather than focussing on the benefits of collaborative research as such – as to whether it would lead Ayurveda to choose between preventive or curative medicine or to solutions to chronic illnesses, etc. - I will try to understand how, theoretically speaking, it fulfills a professional 'need' for those who partake in it.

Institutionalization and expertise: creating conditions for collaboration

As I indicated in the third chapter, the sub-culture of modern science operating in Ayurvedic research may have helped the latter in acquiring new competencies. Not only

have modern processes of clinical research, experimentation and testing of new cures begun to form part of the normal problem-solving activity, but the practice of documenting and recording such research has been institutionalized. The nature and scope of research undertaken in Ayurveda today is symptomatic of a change in the scientific attitude and ethos that allows for individuality - a quality held high in the practice of traditional medicine - but that recognizes nevertheless, that individual ideas are supported by reasons which other people can verify. It also implies that practitioners of Ayurvedic science should somewhere be willing to accept the judgement of critical experiments as to whether they have made out their case.

Hitherto, in addition to other factors, the idea of a collaboration between the Ayurvedic and western systems was impossible to begin with because the two traditions of medicine used different units of measurement – the most fundamental block on which medical research is premised. Among other techniques, the adoption of the metric system of weights in Ayurvedic research has created a common ground at the most basic level on which the two can interact, enabling a number of collaborative studies in the sphere of drug research. The growing number of multi-centric trials in modern Ayurvedic research implies that the use of standards of measurement and formulations has influenced the site of doing research. From discrete contexts where individual physician doctors and research doctors (sometimes the two roles merged in one) carried out research studies independently - and where they used their own measures for Ayurvedic formulations and herbal blends - now the research process is broken up into procedures that may be undertaken by different scientists in different places⁷⁸.

⁷⁸ The WHO Expert Committee met in Geneva in December 1982 to offer solutions to the problem of the accessibility and availability of the most necessary drugs in developing countries. It came out with a Report that enlisted such drugs with adequate information on the properties, indications and use of the drugs corresponding to national health needs. Unless some sort of a standard on formulations and use of Ayurvedic drugs is evolved, Ayurvedic preparations will continue to be kept out of such lists, despite being considered an important component of essential drugs by the people. Standardization is crucial for the successful integration of traditional medicine into the general 'medical innovation' system of the country.

The practice of such studies culminating in scientific communications assessed by referees and other scientists also has a direct bearing on the quality of such communications. One should not assume that the procedures and methods of the expert are visible only at an intimate level to other experts (Gerver and Bensman, 1954; 227). The imputed results of expert action, by being offered for publication in journals are available to, and observable by the distant lay person. Though there have been no statistical studies to prove this, papers in collaboration would ordinarily be more prepared than private scientific papers because collaborating with scientists of modern medicine could have the effect of throwing open the results of research to a wider readership. The system of sharing of credit itself motivates to institute and maintain arrangements for adequately assessing communications.

Modern Ayurvedic research has demonstrated that it is able to judge the value of medical data by assessing the credibility of the sources the data derive from – whether person or classical texts or colleagues or recent research. Together with the *communism of knowledge* that characterizes such research, the task of taking Ayurvedic medical knowledge forward then becomes a social process characterized by the (re)construction of medical data and procedures in and through the ongoing interactions between research doctors and scientists in Ayurveda and western medicine.

I have discussed in the second chapter that one of the more striking results of institutionalized Ayurveda has been the formation of the expert knowledge base in Ayurveda. Functional specificity is an institutional feature of the professional sphere and this is a very important sense in which the professional practitioner in our society exercises authority (Parsons, 1939; 460-461). Seen in terms of collaborative ventures, the professional authority of an Ayurvedic research doctor is based not on a generally superior or inferior status, or on a manifestation of superior “wisdom” or higher moral character, but rather on technical competence. The peculiar sociological structure of this

professional authority is that its area is limited to a particular technically defined sphere (ibid., 460) because, like other elements of the professional pattern, this authority is characterized by specificity of function.

A collaborative generation of knowledge has to be expert-led. Attempting to understand the *nature* of distribution of tasks among professionals participating in collaborative research studies (who represent different branches and traditions of knowledge) was outside the scope of my study, but some conclusions on the organization of such research can certainly be drawn even from secondary sources. It is based on the use of *expert labour*⁷⁹, and we must emphasize that it would not have been possible without the division of expert labour within the system of professions. Eliot Freidson, in his detailed study of the organization and control of medical work⁸⁰, has observed that the stance of an 'expert', as contrasted with that of the entrepreneur or the official is not focussed on gain or on rules but rather on the skillful and conscientious performance of work as it is evaluated by fellow workers or the collegium (Freidson, 1975; 89). For the expert, who usually performs the role of the craftsman, the focus is on judging the "functional propriety" of his medical knowledge base and the ground for decision is usually an expert assessment rather than just a formal rule or merely a gain.

Nevertheless, it is important to recognize that the practice of naming scientists and doctors involved in research has become an indispensable component of research studies in Ayurveda, both collaborative and non-collaborative, and this itself implies something in the nature of a gain for those who participate in it. The sharing of credit and responsibility are the special characteristics of collaborative studies (Brad Wray, 2002; 152), and they are counted by its contributors as an academic gain. A significant

⁷⁹ Albert Abbott has developed a comprehensive sociological theory to describe the origin, growth, division, fusion, and disappearance of professions, relevant to the health-related professions, but the point that I particularly find useful for my purpose is his analysis of 'expert labour'.

⁸⁰ Although Freidson has formulated his theory with physicians in mind, I find it useful to extend it to research doctors and the way organization and control of work is achieved in the medical research setting.

component of studies in collaboration is that research culminates in multi or co-authored articles, and institutionally undertaken studies⁸¹ of this kind allow its participants to not only use their knowledge in a specialized field, but also bring high rewards for this use – rewards usually not available to 'non-professionals' in the field. An interesting observation made at a seminar organized by the National Medical Journal of India and the National Book Trust (NBT) of India titled 'Medical Books in India' (held during the 10th World Book Fair, February, 1992), notes that there "is a lack of motivation for most talented Indian doctors and medical scientists to pen their knowledge. They get greater rewards and wider recognition from their clinical or research work and are given practically no encouragement or opportunities to write books" (Sahni and Nundy, 1994; vii). Compared to Indian medical books, the journal is a more ready and reliable medium among medical professionals in India to communicate one's findings.

By putting the technical and theoretical accomplishments of research doctors trained in Ayurveda to use in this way, it gives the Ayurvedic expert the opportunity to contribute to one's career as well as to the profession itself. Medical research in collaboration, in other words, gives us a better idea of the scope of the element of "functionally specific technical competence" – an essential element of modern institutional patterns (Parsons, 1939; 460).

Recent studies in the philosophy of science note that one of the major consequences of the phenomenon of collaboration is its epistemic import (Brad Wray, 2001; 150). Scientists involved in such research are known to realize the epistemic goals of science, especially in the natural sciences, more effectively than other scientists, and more specifically, the

⁸¹ Particularly the ones conducted by the CCRAS, CDRI and ICMR, because they publish the results of research in the journals that they run. Scientists, whether they are chosen from the *Arya Vaidya Sala* or Postgraduate Colleges of Ayurvedic Teaching, the CCRAS, or the Department of Phytochemistry of a modern medical college, articles carry the names of the researchers who have participated and helped in 'writing up' the results of research. The Dabur Research Foundation makes use of this variety of research in a regular way, but it was impossible to get access to any such study. Conversations with scientists, however, revealed that the most popular mode of research employed by the firm is in the form of collaborative ventures.

relevance of collaboration goes beyond its epistemic merits for science to advance the scientists' epistemic goals themselves (ibid., 151).

But viewed in terms of the participating paradigms, what is the theoretical import of such a zone of interaction between two medical systems? How does it challenge our understanding of 'progress' and paradigm shifts and what is its bearing on the character of knowledge advancement in scientific medical traditions, particularly the so-called 'alternative' traditions?

The Ayurvedic medical paradigm: Progress 'of' and 'within'

The contribution of Kuhn to the sociology of science and the scientific community is the role that he assigns to *paradigms* in scientific research. Integral to Kuhn's notion of theory change in science (and 'progress' as a corollary of that change) is the notion that accumulation and assimilation of the experimental bases of a new theory occurs within the framework of an older incompatible theory itself (Kuhn 1962; vii). The process of the "emergence" of new theories and discoveries is explained thus. 'Paradigms', which he defines as the "universally recognized scientific achievements that for a time provide model problems and solutions to a community of practitioners" (ibid., viii) are essential to scientific inquiry, for "no natural history can be interpreted in the absence of at least some implicit body of intertwined theoretical and methodological belief that permits selection, evaluation, and criticism".

A fundamental theme of Kuhn's argument is that the typical developmental pattern of a mature science is the successive transition from one paradigm to another through a process of revolution. When a paradigm shift takes place, "a scientist's world is qualitatively transformed (and) quantitatively enriched by fundamental novelties of either fact or theory". And the point that I find particularly relevant for the present discussion is that by employing the concept of paradigms to explain development and progress in a

scientific tradition, the idea of progress gets so inextricably linked to the concept of paradigm shifts, that it becomes difficult for us to conceptually accommodate scientific advances in the tradition when they do not involve such 'shifts'. It somehow makes it less legitimate.

When we consider the history of scientific development in western medical research and the classic example of the discovery of the germ - theory of disease, we do not face a conceptual problem in describing it as an "extraordinary, tradition - shattering episode" (ibid.) that necessitated the international medical community's rejection of one-time honoured medical scientific theory in favour of another incompatible with it. Problem solving as well as the problems that needed solving underwent a shift once the theory was accepted, and 'growth of knowledge' in medical science could be explained satisfactorily by the 'paradigm shift' schemata. In reflecting a different model of reality, Ayurveda does not advocate germ-theory or attempt to search for a single cause or cure for an assumed disease entity. Scientific inquiry that is based on a collaborative generation of knowledge is not 'normal science' (because "no part of the aim of normal science is to call forth new sorts of phenomena; indeed those that will not fit the box are often not seen at all" – ibid., 24), yet 'scientific rationality' - the logical force behind collaborative research initiatives in making use of contradictory, and even conflicting medical paradigms to enquire into disease cures - results in an advancement in medical knowledge *despite* and *because of* opposed paradigmatic conceptions. It does not re-look, revise or revisit the ground assumptions of either paradigm in any way. It does not try to address the anomalies of the paradigm as such, but rather suggests that research progresses across medical paradigms and new and unexpected phenomena emerge in its wake, which cannot be accounted for within the paradigm.

In the history of science in general, and in that of medicine in particular, we have become used to spectacular successes – technological and scientific – and advance is believed to

be in the nature of 'breakthroughs'. If we look at Kuhn's ideas closely, his scientific framework seems inadequate not only to explain developments in medical science affected through collaborative research, its conclusions also cannot be applied to understanding the growth of the scientific medical tradition of Ayurveda itself. Developments in Ayurvedic medicine reflect, at most, *alternatives* to revolution.

Kuhn argued that science is not a steady, cumulative acquisition of knowledge. Instead, science is "a series of peaceful interludes punctuated by intellectually violent revolutions". For scholarly medical traditions like Ayurveda, as I have specially noted in the last chapter, knowledge acquisition⁸² and advancement have, indeed, been cumulative and incremental. By adopting and evolving new methods of the scientific evaluation of classical therapeutic claims, progress *of* and not merely *within* the paradigm has occurred, and discoveries made. It has not experienced a reconstruction of the field from new fundamentals, or witnessed changes in some of the field's most elementary theoretical generalizations (ibid., 85). The tradition of normal science has not dramatically changed for Ayurveda, although some of the most striking examples of progress in therapeutics and Ayurvedic drug research has taken place in the past few years. Clinical trials of *Ksharsutra*⁸³, scientific testing of the analgesic activity of gold preparations⁸⁴ in arthritis, anti-diabetic effects of drugs⁸⁵ and effects of specific Ayurvedic compounds in Diabetic Retinopathy⁸⁶, and several other studies that have come about as a result of

⁸² That is, if we were to agree at all, that there has been an advancement in Ayurvedic medicine over what it was when the paradigm was being constructed. The view that Ayurveda has made no advances at all, is quite widely believed.

⁸³ This was a collaborative study undertaken by the ICMR, and it included scientists from various collaborating centres across India. *Ksharsutra* is an Ayurvedic medicated thread that has been mentioned in the classic Ayurvedic texts as a treatment for the management of 'fistula-in-ano'. Multi-centric randomized controlled trials were carried out and the conclusions of the research study proved that long-term outcome with *Ksharsutra* is better than surgery, which has been modern medicine's answer to the medical condition. The study has been published in the *Indian Journal of Medical Research* [B] 94, June 1991, pp. 177-185

⁸⁴ This study was carried out by a team of two scientists at the Jamia Hamdard, New Delhi, to show the positive and negative effects of gold therapy. The study has been published in the *Indian Journal of Medical Research*, 108, September 1998, pp. 104-111.

⁸⁵ This was a study carried out by a team of research doctors at Department of *Kayachikitsa*, Institute of Postgraduate Ayurvedic Education and Research, Kolkata, to establish the anti-diabetic effect of certain plant material. The study has been published in *Aryavaidyan* Vol. XV., No. 3 & 4, Feb – July 2002, pp. 178-186.

⁸⁶ This was a controlled group study carried out by three scientists from the Department of *Shalya* (Surgery) and Department of Ophthalmology, Banaras Hindu University, which concluded that a significant improvement

institutionalized Ayurvedic research have suggested treatments and proven cures to clinical conditions that western medicine has not been able to treat. Although, as I have argued in Chapter Three, the ethos of modern science has improved many of its paradigm methods and applications, this has only enabled Ayurveda to achieve an articulation and extension of the paradigm.

But the real contribution of the Kuhnian framework to any analysis of scientific traditions is that it centralizes the role of paradigms.⁸⁷ That the concept of paradigms becomes relevant because they guide the research efforts of scientific communities is an important idea that Kuhn included in his explanatory scheme, and it is this criterion that, according to him, most clearly identifies a field as a science.

The second area of my concern with the challenges to our understanding of 'progress' arises in a class of arguments that ascribes to 'free inquiry' a significant role in the process of scientific development (Brad Wray, 2001; S 468). In responding to these, my attempt in this dissertation has been to show that scientists' ideas by themselves, do not develop medical traditions; it is a conjunction of a set of conditions, professional groups and institutions that affects scientific development. As is presupposed by Feyerabend's formulation of "theoretical anarchism" (Feyerabend, 1975; 23), the pursuit of knowledge advancement in the Ayurvedic medical tradition would suffer if it were to be an 'essentially anarchistic enterprise'. A collaborative generation of knowledge in particular, is a mode of doing research that inheres a joint rationality condition – where credit and responsibility is shared – and something more than the willingness of individual scientists is needed to enter into such a contract.

could be measured in each component of diabetic retinopathy after therapy with the compound drug *Triphala Guggulu*. This was an important study in retinal disorders caused by diabetes and its management in Ayurveda. The study has been published in the *Journal of Research in Ayurveda and Siddha*, Vol. XXII No. 3-4, 2001, pp. 208-215.

⁸⁷ The debate over whether traditional medicine offers a competing paradigm to the biomedical model of thinking, or whether the absence of paradigm shifts in it reflect a lack of progress, will continue, but it is essential to owe to Kuhn that he made the role of paradigms significant.

The utility of expert knowledge in collaborative research, the idea of collective research in Ayurveda, inclusion of modern science models in the course of the study, and scientific communications of the results of research together go to suggest that the enterprise of science in the Ayurvedic tradition of medicine would suffer if it were to rely entirely on 'free inquiry'. It depends upon *institutions* that are structured to ensure that medical research is helped, and not impeded by these changes. It needs to be pointed out that a significant part of the progress made in Ayurveda has to do with the formal organization of scientific knowledge in Ayurveda, and systematizing the utility of the resultant expertness towards scientific inquiry in medicine cannot rely entirely on the ideas of scientists, however progressive they may be.

Society produces its institutions. And institutions produce and regularize processes, incorporate solutions - sometimes solutions hitherto not experimented with - into the institutional order.

We have seen that institutionalized Ayurvedic teaching and practice have been able to create a research environment where showing the effects of Ayurveda to both experts and lay is more and more the norm. It is incorrect to believe, as critiques of western medicine have sometimes, that in the 'alternative' paradigm of traditional medicine, knowledge is more lay than expert oriented (Whitelegg, 1995). 'Alternative' medicine, it is believed, promotes a more relativist approach than the one in 'modern medicine'. Knowledge in the former is seen as a social product, the public being enrolled in its generation, and knowledge context as "a living process owned by people and subject to other rationalities than those of the expert system" (ibid.). Ayurvedic medicine has been less 'open' than its 'modern' counterpart, and the lay person could never play the role of an informed

consumer of medical advances articulated in a language⁸⁸ that was accessible. It is only now with institutionalized communication and dialogue that a transfer can be made from expert knowledge to users' knowledge.

The need for communication across paradigms has been felt from time to time. Some writers ask the question "why is it that the entrenched scientific paradigms like biomedicine has been a paradigm that has been bereft of dialogue, debate and reason for years? The result is that today the biomedical model is not perceived as a model at all but rather, as a scientific fact" (Allan and Hall, 1988; 22). Medically pluralist societies like our own have not found a platform on which to initiate a dialogue between the western and Ayurvedic systems of medical thought.

Habermas' theory on communicative action, though not entirely appropriate to our discussion, may be selectively applied to make an important observation about the existing condition of dialogue. An ideal speech situation, he argued, would be one where differences in power between speakers is minimized⁸⁹, so that the contributions of 'lower status discussants' is not inhibited. The latter formulation is of utmost significance to discursive exchanges between the Ayurvedic and the western paradigm. The very entry into discourse presupposes that participants are in adherence with some minimum essentials of communication. This itself takes away from Ayurveda the status of a lower level discussant, which, in fact, it has been, and which allows it to express itself as an expert discussant.

⁸⁸ It is well known that the language in which ancient medical Ayurvedic knowledge was articulated has itself been an impediment to making the science accessible. Knowledge of Sanskrit was restricted by caste and sex and it took many years and a lot of initiative for the first translations to take place.

⁸⁹ Habermas' main concern was with developing a theory of society that aimed at the self-emancipation of people from domination. Of importance to him was the situation of the 'ideal speech' that would allow for the criticism of ideologies and the exchange of views and disagreements between the discussants. The output of such a situation, he envisaged, would ultimately be in the nature of a gain of consensus, an agreement, or an 'adherence of minds'.

The concept of "integrative medicine" in India is, as I pointed out at the beginning of the chapter, not new. The first such effort was made in the wake of the colonial encounter itself. Native Medical Schools were started in Calcutta and Madras in 1822 and 1835, respectively, (Madan, 1980; 18), where trainees of Indian medicine were instructed in both modern and Ayurvedic medicine. A break with this policy of integrated medicine came in 1855 when the school at Calcutta was converted into a college of modern medicine, following which, the course of studies in medical education became identical to that in the West. "What must then have been hailed as a progressive step towards the standardization of medical education today appears as a tragic aberration in the history of the growth of the medical profession in India" (Madan quotes K. N. Chopra, 1986; 19). The opportunity to integrate the two on a scientific basis was missed, and this "necessary" task has become increasingly difficult with the passage of time as extraneous considerations have crept into the situation (ibid). A strong plea for a rational approach to the evolution of an integrated system of medicine was made in 1948 by the General President of the Indian Science Congress, who argued that traditional medicine could address the lacunae that modern medicine showed, because the practice of modern medicine had its 'unscientific' aspects.

Dominik Wujastyk, in his thorough study of medical images in ancient texts of Ayurveda observes that whatever prospects of an encounter or a dialogue of the traditional with the western existed, were abandoned when compilers and editors of Sanskrit manuscripts increasingly took to being content with explanation of Sanskrit terminologies in English (Wujastyk, 2001). "The abandonment of any attempt at comparative and observational anatomy in the *Sastry* (1931) edition is coupled with a scientism in the editor's explanation of respiration...This combination of elements, i.e., the loss of interest in observation and comparative anatomy, and the rise of fanciful scientific readings of the pre-modern texts, is a regrettable development" (ibid., 29).

In addition to much time and effort being invested in reviving the Ayurvedic tradition from the state that the colonial encounter had left it in, part of the reason as to why there lacked any interaction with other paradigms was the absence of the conditions of research that I hope I have been able to clearly point to. The authority and distinctiveness of reason and scientific rationality, which is a characteristic of the modern urge to communicate across paradigms, requires that progress is not a necessary outcome of the 'logical force' (Feyerabend, 1975: 25) of the better argument, but because of the inherent advantage in it for science and the scientific community.

When the emphasis is on utilizing the cognitive contribution of scientists in a scientific activity of any kind, proponents of two paradigms might well engage in meaningful discourse. And in providing a sociologically adequate explanation for this, it is important that we consider the two medical systems as paradigms that are different and competing, not as traditions that exhibit similarities.

The problem with initial attempts at fostering some kind of an interaction of paradigms was that these were broad enough to accommodate anything that resembled a synthesis of paradigms. A late nineteenth - early twentieth century willingness to look at medicine as a unified truth, and to consider synthesizing Ayurvedic and allopathic anatomies faded after independence, when such a willingness was abandoned. And apparently an attitude has since been widely adopted that Ayurveda and allopathic body images are either fundamentally incommensurable, or that they cannot be brought together except by interpreting Ayurvedic body narratives in terms of contemporary scientific terminology and concepts (Wujastyk, personal communication).

But in this new dialogue that may be discerned in the practice of collaborative studies, the voice of sectarianism has temporarily been submerged. By implication, at least, I am suggesting that historians of science and medicine in India should account for the

observational and conceptual recognition of something new, and not treat it as a case of 'big science' confronting 'alternative science'. It is one possible way of understanding how difference can be valued and how distinct traditions of thought – 'traditional' and 'modern' – relate to each other professionally rather than merely remaining parallel, dual operating types. Although it is too early to definitively argue that this is the most appropriate relation that component systems of a medically pluralist society may share with each other, it is important to note that this sort of a dialogue begins on a recognition of *achievement*. And this itself goes to show that there is no need to adopt any relativist standpoint as have 'purist' and 'integrationist' efforts of the past that were aimed at 'preserving' the distinctiveness of Ayurveda; that Ayurveda and western medicine can, indeed, confront each other as epistemic equals; and that it is not time yet to collapse the debate on collaboration.

Chapter Five

Conclusion

If modernity suggests a condition or an experience, then the qualifications required to show its existence should also be clear. 'Modernization' of medicine is a term used ambiguously by both the academia and the public at large, to refer to an incorporation of the ways of diagnosis and therapy in the Western medical paradigm as a universally useful means to understand processes of change in a medical system (Young, 1976; 5). Many of the features typical to modernity have a resonance in the Ayurvedic profession today, and my effort in this dissertation has been to show that the process of modernization of a traditional medical system gives rise to certain conditions that favour a 'modern' experience for the same in a medically pluralist society.

T N Madan's exploratory study titled 'Who Chooses Modern Medicine and Why' was premised on the assumption that "medicine is an important field in which displacement of the traditional professional, through absorption of his knowhow by his modern counterpart, is an essential part of the process of modernization" (Madan, 1969; 1475). If one had to, therefore, analyze 'modern medicine', or the modernization of traditional medicine, the implication was that one should start by looking at how *conflict* between two medical systems ultimately leads to *displacement* of one by the other, and how such a trend was of crucial importance to the process of modernization in medicine. The obverse of this clearly is that where such 'replacements' fail to occur, one cannot realistically talk of medical modernization.

Even to discuss traditional medicine in 'modern' terms is an enterprise of which many in the medical profession in India would disapprove (practitioners of western medicine mostly, but also including a large number of Ayurvedic professionals of the 'purist' camp), because they subscribe to the view that scientific medicine is western medicine is modern medicine. The former, particularly, believe that the system of medicine they are practicing is sanctioned by science and modernity, and others are not.

If we take modernity to be an attitude which represents universalistic norms, then medical modernization in Ayurveda - that has seen increasing emphasis on institutional knowledge and in the standardization of research methods and research communication - may be understood as a process that is certainly shedding tradition. The practice of science in Ayurvedic research today favours the conditions that are typical to the experience of modernity and that are different from its earlier counterpart which was not only traditional, but decisively 'pre-modern'. Science becomes a crucial component of modernity when we understand the attributes of knowledge obtained through the application of the scientific method. These include: the right to question and the absence of high priests or godmen who cannot be questioned; the absence of 'know-alls' in science because scientific knowledge can never claim to be complete; and the status of scientific truths as truths by consensus (Bhargav, 1996; 348).

The increasing reliance on institutional versus non-institutional sources of expert knowledge in Ayurveda (theme of chapter two), the collective versus the individual orientation of research and the systematic re-evaluation of classical Ayurvedic therapeutic claims (theme of chapter three), and finally, a concern with addressing and including the Other to re-establish its own identity (theme of chapter four) are areas that need to be highlighted to be able to discern the results of the modern project in the Ayurvedic medical tradition. Let me summarize how.

The importance of *institutions* in the making of a modern society has been pointed out by several scholars of modernity. Some recent attempts to understand it have consciously moved away from past themes in discourses of modernity that were based firmly on the idea of the realization of freedom, autonomy and liberty of the individual and where an increase in individual autonomy was usually linked to the approach of modernity (Wagner, 1994; 5). But it is possible to see the illustration of, particularly in

the light of the Ayurvedic movement to modernize itself as a profession, a narrative opposed to that of liberation – one that emphasizes the process of *disciplinization*.

The professionalizing process in Ayurveda cannot be understood as being motivated by the thought of the collective outcome of liberations in mind. It may be seen, rather, as a movement to create institutions that restrict or contain the occurrence of individual variations in the teaching of Ayurveda, undertaking research in it, and in dispensing knowledge about it to other medical professionals and to the lay. It may also perhaps be seen as an example of “emancipatory praxis” that is aimed at the transformation of an existing order into another established organizationally (Habermas, 1985; 328) for the gain of collective agency.

Institutions are understood as relatively stable sets of rules and resources, which human beings draw on in their actions (Wagner, 1994; 19). By routinizing formalized modes of production of knowledge and research, institutions involved in professionalizing Ayurveda enable new modes of social organization of resources - material and human⁹⁰. There is a difference in the way resources are organized at an individual level and the treatment to which they are subject institutionally. The durability and solidity of rules that are the unique features of institutions help to 'conventionalize' practices and may even induce a positive process of rule change (ibid., 20). This comes close to what we have observed not only in the regularization and systematization of the practice of the protocol, the controlled study, and the pattern used for communicating discoveries and experiments in Ayurveda, but also in the conventionalization of professional knowledge. This, as we have seen, implies knowledge obtained institutionally, and it results in the steady increase in the number of institutionally qualified practitioners over its non-institutional counterpart. In terms of their relative stability, durability and solidity, it may be

⁹⁰ Among other things, the process of institutionalization entails an emphasis on the advent of a new order that is universal and total and demands conformity and discipline more than anything else.

said that institutions shape and re-shape individuals, that they imply certain modes of training and modification of individuals, not only in the obvious sense of acquiring certain skills, but also certain attitudes. Institutions are, therefore, by nature, *enabling*⁹¹ (ibid).

Wagner's "enablement" can be conceptually compared to Giddens' "facilitating conditions" (Giddens, 1990; 63) – a central concept in the latter's institutional analysis of modernity. Anthony Giddens, in 'Consequences of Modernity' notes that there is something in the "intrinsic nature of modern institutions" that separates these social institutions from traditional social orders (ibid.; 6). Though his concern is primarily with four institutional dimensions of modernity, where the phenomenon of *surveillance* constitutes one of the dimensions⁹², the concept of surveillance is fundamental to all the types of organization associated with the rise of modernity. The level of administrative coordination achieved in modern orders depend upon the development of surveillance capacities well beyond those characteristic of traditional civilizations, and he argues that "no premodern states were able even to approach the level of administrative coordination developed by the nation-state" (ibid.; 57).

Of importance to our discussion is Giddens' understanding of institutional clusterings that is ultimately the force behind the dynamism of modernity⁹³. The formation of "organizational clusters" (ibid.; 55) assumes an extremely central role in the modernization process of the Ayurvedic medical system⁹⁴. Important and effective as

⁹¹ Peter Wagner has attributed to institutions both, the 'enabling' as well as the 'constraining' role, because he argues that institutions are a set of rules and conventions that impart skills to people as well as modify and bind them.

⁹² Giddens introduces us to four institutional dimensions of modernity – capitalism, industrialism, surveillance and military power. Surveillance refers to the supervision of the activities of subject populations in the political sphere – although its importance as a basis of administrative power is by no means confined to that sphere.

⁹³ Giddens talks about three main sources of the dynamism of modernity: time-space distanciation, disembedding of social relations from their local contexts, and reflexivity. These are not, as such, types of institutions, but rather facilitating conditions for the historical transitions.

⁹⁴ Giddens' terminology is useful in understanding the import of institutions and organizations to the Ayurvedic movement. In so far as the development of Ayurvedic education and research constitutes a crucial component of the movement to organize Ayurveda as a profession, the administrative and surveillance functions that institutional clusters in Ayurveda have performed, are, indeed, of a scale and

individual professionalizing efforts in Ayurveda have been in the past, the influence that the institutionally driven collective agency has had on the movement can not be ignored. In this sort of an understanding of modernity, we are bound to see the importance of a 'system' of things and of the indispensability of institutions to a modern social structure. The rate and nature of innovations in the Ayurvedic medical system are important to recognize, but so are the institutional features that enable them. The development of the Indian medical system of Ayurveda has specific institutional features and it is time that we include these in sociological and anthropological discussions of Ayurveda today, especially in the context of understanding *modernization* in it.

This is also reflective of another characteristic of modernity. The ability to trust institutions rather than individuals is typical to a modern society where particularistic criteria such as personal trust, personal loyalty and patron-client dependence (Gupta, 2000; 212) matter less and less in determining one's choice of action. Trust is a form of faith, in which, the confidence vested in probable outcomes expresses a commitment to something, rather than just a cognitive understanding (Giddens, 1990; 27). I have discussed in chapter three how prohibitive the system of Ayurvedic education has been by basing entry on qualifications of caste, language, gender and family. In contrast to the pupilage or the family system of imparting medical education, the western model of education adopted in the Ayurvedic institutes of graduate and postgraduate learning in our country should not be appreciated (or criticized, for that matter) because it is western, but because it is modern. It is based on universalistic norms that apply to all⁹⁵. The question is far from whether particularistic tendencies have ceased to matter altogether or not. The point that needs emphasis is that the preference for institutions reflects a preference for universalistic criteria, and that a growing sense of trust in

nature that could not have been substituted by individual initiative in education, or research, or for that matter, in Ayurvedic practice.

⁹⁵ By 'all', I mean students admitted as well teachers appointed.

impersonal degree - conferring sources of expert knowledge rather than the traditionally learnt expert knowledge does indicate a shift from trust at the individual level.

My main argument then, is that institutionalized Ayurveda has gained recognition as a modern medical system. Institutions connect individuals to large-scale systems, and a modern understanding of the development of the Ayurvedic medical tradition must recognize the discontinuities which separate modern Ayurvedic institutions from the way in which it was organized traditionally.

Let us now shift to another crucial characteristic of modernity – its *reflexive* character. The reflexive ordering and re-ordering of social relations in the light of continual new inputs of knowledge is a shift that coincides with the expansion of modernity (Giddens; 1990). I had noted in chapter three, that the two seminal Ayurvedic treatises were constantly interpreted and re-interpreted by successive physicians and *vaidas*, who, in documenting their revised versions, contributed meaningfully to the wealth of classical literature on Ayurveda. But this is qualitatively not the same reflexivity that is institutionalized in modern Ayurvedic research. Tradition can be justified, but only in the light of knowledge which is not itself authenticated by tradition. Knowledge claims produced by classical Ayurveda have not only become revisable in principle, but also become revised in a *practical* sense in being circulated differently from how they were done in the past. In so doing, they have altered the very environment of discovery and justification of knowledge claims. Kant's focus on enlightenment was, after all, not about *determinate judgement* that judges under rules that are already fixed, but about *reflective judgement* (Lash, 1999; 2).

Modernity effectively involves the institutionalization of doubt (Giddens, 1990; 176). And this is something that is constitutively fundamental to modern Ayurvedic research

and collaborative efforts⁹⁶. The very concept of multi-centric trials, for instance, implies that the incorporation of uniform modes of measurement has helped in 'dislocating space from place' (ibid.). This provides the gearing mechanism for a distinctive feature of modern Ayurveda – rationalized organization of education and research.

The self-reflexive character is not difficult to discern, but what is of unique and special significance to the knowledge - developing activities in Ayurveda in contrast to its traditional counterpart is that this attitude itself forms a universe of events in which dialogue with the Other takes on a novel character. This brings me to my final point on the interpretation of the development of a traditional medical system from the optique of the modernity theory.

Reflexively applied knowledge in the way that modern Ayurvedic research has regularized, gives rise to a new attribute of such knowledge – its *inter-subjective* character. Intersubjectivity, for a system of medicine in a medically pluralist situation, would imply being able to understand other existing systems, the ways that make them differ from each other and those that make them similar, and to ultimately be able to participate in each other's progress despite belonging to different paradigms. Discursive argumentation, including that which is constitutive of natural science, involves criteria that override cultural differentiations. There is nothing 'western' about this if the commitment to such argumentation, as a means of resolving disputes, is forthcoming (ibid.; 176).

'Intersubjective' does not mean 'agreement', or 'sameness' or 'uniformity', but rather, a concern that encourages one system to incorporate, in its production of knowledge, the notion of the 'other'. Beginning with Hegel, who argued for the importance of the Other

⁹⁶ Many would be opposed to the path of modernization that Ayurveda has set itself on, and more specifically, of developmental efforts in collaboration. As Giddens frames it, the radicalizing of doubt is itself

in the understanding of the 'self', several thinkers have noted that in modern orders, it becomes possible to individuate oneself *through* the appreciation of the other. Norbert Elias' and Emmanuel Lévinas' most significant contribution to studies in modernity has been to point out that this ever-present consideration for the 'other' marks off modernity from any order prior to it. According to Lévinas, it is the full and the responsible response to the call of another, and not its insular workings that makes up the human consciousness in modernity (Lévinas; 1998).

The practice of standardization, documentation and communication that constitute a central feature of the conduct of Ayurveda today, incorporate the notion of the Other in many ways. The tendency to describe, record and communicate the steps and results of research is inherently extensional. It develops science by taking it beyond the boundaries of its own paradigm and its immediate practitioners to professionals in the field of medicine who represent other paradigms, as well as to laypersons. Increased scientific exchanges⁹⁷ in journals, books and monographs, seminars and publications thereof, fairs, marketing activities, etc. are all pointers to the growing concern with taking Ayurvedic science *beyond* its own, and *across*, medical cultures. In doing so, it learns to self-express better and re-constitute its own identity. Difference should not be understood as the opposite of identity, but rather, as something that helps to establish it.

I would like to mention here that the Ayurvedic movement has, at many points in its life, been used (as has any holistic medicine movement) to symbolize an opposition to capitalist interests. The concern with advertising and marketing is 'capitalist' and therefore, western, and therefore also something that 'tradition' has to be guarded against. Over the past few years, instances of advertising of Ayurvedic products in

always subject to doubt and therefore a principle that provokes stern resistance.

particular, and holistic medicine products in general, have grown, and while it is generally prompted by an awareness of the risks of biomedicine⁹⁸, it may also be understood as a conscious effort on the part of the Ayurvedic community to take the benefits of its science to the public. Innovative ways of publicity have become popular⁹⁹, as have the roping in of technology to initiate the first - ever mass production of Ayurvedic medicines¹⁰⁰ and their good marketing. Ensuring easy availability and longer shelf - life of drugs has been one of the reasons for the popularity of the allopathic system, and there are plenty of such links of the integration of Ayurveda and commerce. Propaganda should not be construed to be the exclusive preserve of 'modern' (western) medicine.

The New Millennium Indian Technology Leadership Initiative (NMITLI), which is a set of projects involving close to a 100 institutions (Hari, 2002, 44) is a development project that supports the use of Ayurvedic medicine and knowledge in developing improved drugs. The studies are to be undertaken in areas that have no real treatment in modern medicine, particularly in studies of osteoarthritis, rheumatoid arthritis, diabetes and liver disorders (ibid. 50), using all 'modern methods' on medicinal plants and preparations to ensure and standardize uniformity in herbal formulations. Ashok Vaidya, the Director of

⁹⁷ Bruno Latour has expressed a sense of the 'openness' of scientific work in saying that "scientific work itself destabilizes any distinctions between what is inside and what is outside of science, or between what is scientific and what is social".

⁹⁸ In the West particularly, advertising, marketing and knowledge of Ayurvedic products has gone up because of more awareness than ever before, of the risks of iatrogenic medicine. As I had pointed out in my first chapter, this is subsumed under the general interest that CAM (Complementary and Alternative Medicine) has generated in the US, where Ayurveda, and folk or tribal medicine, water and aroma therapy, chiropractic and osteopathy, are all loosely and residually lumped together to constitute a critique and, it is hoped, an alternative and complementary answer to the ill-effects of allopathic medicine.

⁹⁹ The recent week-long fair held in New Delhi named *Arogya*, saw participants from various corners of the Ayurvedic community. From pharmacists, research and clinical doctors, to research centres and teaching institutes, representatives of the Ayurvedic profession dispensed information on Ayurveda and Ayurvedic products in new and innovative ways – from the organization of art festivals to distributing magazines and pamphlets, it was an exercise that was centered on making 'available' information, knowledge and products of traditional medicine in a way that would be branded 'capitalist' by many. A lot of us are under the illusion that if it is 'traditional', it should steer clear of western influence, particularly as far as propagating it is concerned.

¹⁰⁰ M. G Radhakrishnan provides an account of mass production of Ayurvedic medicines at the Arya Vaidya Sala, Kotakkal, pioneered by the head of the Institute. To learn more about the motivation to produce Ayurvedic cures in a manner that clearly indicates a shift from the earlier style of preparation of herbal concoctions that were individually prepared for each patient, read " Man For All Cures" *India Today* March 4, 2002, pp. 51-52.

the Interdisciplinary School of Health Sciences, Mumbai, believes that understanding the WHO and the US Food and Drug Administration regulations is a crucial step in widening the traditional knowledge base and in addressing a "global market" (Quote borrowed from Hari, 2002, 50).

Developed modernity is characterized by an attitude of equality with, and respect for, others. Expertness is an important pre-requisite to developing this 'otherness', because it helps to sharply define areas of technical accomplishment and professional expertise of a system of medicine, and this alone can make for a sufficient condition for dialogue with both the layperson and the medical expert representing another paradigm. The social recognition of Ayurveda as an expert system has a bearing on its being able to communicate better across paradigms, and appear more 'open' and less mysterious and 'puzzling' to the lay.

By now, it should be clear that the emphasis on institutionally qualified knowledge has an import on the changing definition of expertness within the Ayurvedic profession¹⁰¹. But this also goes to strengthen the argument that some sociologists have extended in order to mark the specificity of the sociology or anthropology of illness as a discipline: the essentially dependent relationship between the healer and the patient (Gupta, 1988; p. 404). If it was not for functionally specific expert knowledge, the "dependency-credibility complex" (ibid. 404) that is peculiar to the assumption of a 'sick role', would fall apart. This dependence on the practitioners of a medical system to achieve rehabilitation and restoration to normal social life is brought about mainly because of the asymmetry in knowledge held by the professional and the layperson. The very "logic of the ill-health situation" (ibid.; 409), is held together in place by virtue of this expertise, and this is also what puts the former and the latter at two different ends of the dependency-credibility

¹⁰¹ 'Credibility' is a key word in this context, and while it cannot be said definitively that institutional knowledge vis.a.vis its non-institutional counterpart necessarily means more or *better* knowledge, it perhaps

equation. Contrary to what some scholars may like to argue, holistic medicine is no more 'people-friendly' than is western medicine¹⁰², and holistic medicine movements (as has been done by the Ayurvedic movement), should, indeed, promote the idea that expertness ought to be developed for the sake of the legitimacy of the medical system.

Having said that, we must admit that expert knowledge is not new to the profession of Ayurveda. The asymmetry in knowledge has been a component of classical, traditional Ayurveda. But what is decidedly different and constitutively modern is the interaction between expertise and the *reappropriation* of expert knowledge. It is in this sense that 'equality with' and 'respect for' others marks off the modern concern of Ayurveda.

The point is hardly whether a traditional science, to progress, must transform itself to resemble a western one. My contention is that we cannot afford to indulge in the escapist argument that there are several 'brands' of science, and justify in the name of 'difference', the closed character of a traditional science. Yardsticks cannot be dispensed with¹⁰³. There has to be a minimum meaning attached to the way science is 'done', and the incorporation of the principle of *communism of knowledge* (Merton, 1973; 270) into the practice of articulating Ayurveda has made the project of modernization of the scientific system of Ayurveda more meaningful. It has provided Ayurveda with new opportunities for what may qualify as a modern experience in a medically pluralist society.

imputes to the former a sense of *credibility* that the non-institutional professional is not socially recognized as possessing.

¹⁰² It is also commonly believed that while 'alternative' medicine can be self-administered, it may be dangerous to do the same with western medicine, which must always be used under the guidance of a doctor. The prescription of the doctor in Ayurveda is as important to get as for its western counterpart. 'Health by the people' is a misleading concept in this sense, in that it does not recognize the contribution that expert, technical and professional knowledge makes in defining the legitimacy of a medical system.

¹⁰³ I find it difficult to see why there should be different concepts for different contexts. Analyzing things 'on their own terms' can be quite detrimental to an intelligible understanding of them mainly because they prohibit comparisons of any sort, which, I think, discourages a uniform discourse on any topic. In this particular case, it discourages a discourse on science.

The traditional - modern dichotomy has been central to sociological analysis. But it is important to be clear about exactly those characteristics that mark the rupture from traditional to modern and to show in what ways they actually break from tradition. Often, instances of Ayurvedic doctors using modern equipments to diagnose and treat are referred to. 'Resemblance' of Ayurvedic texts, Ayurvedic professionals and Ayurvedic practice to their western counterpart is also frequently taken as proof of modernization. While at its other extreme, the notion of similarity is suppressed and an opposed notion of 'difference' is highlighted, where the medical system of Ayurveda is supposed to serve a 'contradictory function', representing everything that western medicine does not. In fact, it is not uncommon in sociological and anthropological discussions to find arguments that treat people's medical preferences as a reflection of their preference for modern or traditional forms of thinking.

I began by asserting that there are certain themes in the master discourse of medical pluralism that have been conventionalized in academic discourse on Ayurveda. The potential contribution of the Ayurvedic movement has not been fully appreciated in the literature. Justification of the survival of Ayurvedic medicine has often become a matter of embracing tradition and rendering it safely in the past tense. The chronological advantage of Ayurveda over western medicine or the nationalistic role played by the former is not an adequate explanation for Ayurveda's claim to a status that is 'equal' to modern medicine's. These themes do not only presuppose a fairly strong idea of the separation of the modern and the traditional according to different logics, but they also introduce assumptions about how innovation, science, progress, and finally modernity, is the prerogative of western medicine. But what is the logic of these associations? We must remember that in discussions of modernity, modern medicine assumes significance because it has played a central role in representing modernity as the progressive realization of the capacity to use reason and science to improve human welfare. The idea of the modern generates a sense of difference, while at the same time

intersubjectively understanding the other. What I have aimed to do in my research is to find an entry point for an alternative discourse on Ayurveda (a discourse that is self-consciously modern), and suggest that there are strong reasons for doing so.

"Scientific progress", as Weber argued, is "a fraction, indeed the most important fraction, of that process of intellectualization which we have been undergoing for millennia" (Weber, 13). I hope that I have been able to clarify what this intellectual rationalization means for the enterprise of knowledge advancement in the Ayurvedic medical system today. It has been my aim to emphasize that while innovations in the Ayurvedic system have a specious continuity with tradition, it is a definite break from the 'pre-modern'.

Bibliography

Books and Journals

1. Aakster, C. W 1986, "Concepts in Alternative Medicine", *Social Science and Medicine*, Vol. 22, No. 2, pp. 265 - 273
2. Allan, Janet D and Beverley A Hall 1988, "Challenging the Focus on Technology: A critique of the Medical Model in a Changing Health Care System" *Advances in Nursing Science*, Vol. 10 (3), (April) pp. 22 - 34
3. Alter, Joseph S 1999, "Heaps of Health, Metaphysical Fitness", *Current Anthropology*, Vol. 40, Supplement, (February) pp. S 43 - S 66
4. *áryavaidyan* (A Quarterly Journal of the Arya Vaidya Sala - Kottakkal) 2002, Vol. XV., No. 3 & 4, (Feb-July)
5. Baer, Hans A 1995, "Medical Pluralism in the United States: A Review", *Medical Anthropology Quarterly*, 9 (4), pp. 493 – 502
6. Bajaj, Sonia and S. B Vohora 1998, "Analgesic Activity of Gold Preparations used in Ayurveda and Unani-Tibb" *Indian Journal of Medical Research* Vol. 108, (September), p. 104 - 111
7. Berg, Marc 1997, "Problems and Promises of the Protocol", *Social Science and Medicine*, Vol. 44, No. 8, pp. 1081-1088
8. Berliner, H. S and J. W Salmon, 1980, "The Holistic Alternative to Scientific Medicine: History and Analysis", *International Journal of Health Services*, 10 (1): pp. 133-47.
9. Bhargav, Pushpa M and Chandana Chakra 1996, "The Scientific Temper and the Scientific Method in Science in India through History, With Special Reference to Biology" in D. P Chattopadhyay and Ravinder Kumar (ed.) *Science, Philosophy and Culture: Multidisciplinary Explorations, Part One*, Munshiram Manoharlal Publications, New Delhi
10. Brad Wray, K 2001, "Science, Biases and the Threat of Global Pessimism", *Philosophy of Science*, Vol. 68 (Proceedings), pp. S 467 – S 478

11. Brad Wray, K 2002, " The Epistemic Significance of Collaborative Research" *Philosophy of Science*, 69, (March), pp. 150 – 168
12. Brass, Paul R 1972 "The Politics of Ayurvedic Education: A Case Study of Revivalism and Modernization in India" in Susanne Hoeber Rudolph and Lloyd I Rudolph (ed) *Education and Politics in India: Studies in Organization, Society and Policy*, Oxford University Press, Delhi
13. Chaturvedi, G.N and Gurdip Singh 1988, *Clinical Studies on Kámalá (Jaundice) and Yakrt Rogas (Liver Disorders) with Ayurvedic Drugs*, Central Council for Research in Ayurveda and Siddha, Ministry of Health, Government Of India, New Delhi
14. Cho, Hyo-Je 2000, "Traditional Medicine, Professional Monopoly and Structural Interests: a Korean case", *Social Science and Medicine*, 50, pp. 123 - 135
15. Connor, Linda H and Geoffrey Samuel 2001, (ed) *Healing Powers and Modernity: Traditional Medicine, Shamanism and Science in Asian Societies*, Bergin and Garvey, London
16. Denton, John A 1978, *Medical Sociology*, Houghton Mifflin, USA
17. Dunn, Frederick L, 1998 "Traditional Asian Medicine and Cosmopolitan Medicine as Adaptive Systems" in Charles Leslie (ed.) *Asian Medical Systems: A Comparative Study*, Motilal BanarsiDass Publishers Pvt. Ltd., Delhi
18. Feyerabend, Paul 1975, *Against Method: Outline of an Anarchistic Theory of Knowledge*, Humanities Press, Atlantic Highlands, London
19. Foster, George M and Barbara G. Anderson, 1978, *Medical Anthropology*, John Wiley and Sons, New York
20. Foucault, Michel 1994, *The Birth of the Clinic: An Archeology of Medical Perception*, Vintage Books, New York
21. Fox, Renee C 1998, "Sociology of Modern Medical Research" in Charles Leslie (ed.) *Asian Medical Systems: A Comparative Study*, Motilal Banarasidass Publishers Pvt. Ltd., New Delhi, pp. 102 - 113.

22. Freidson, Eliot 1975, *Doctoring Together: A Study of Professional Social Control*, The University of Chicago Press, Chicago
23. Gerver, Israel and Joseph Bensman 1954, "Towards a Sociology of Expertness", *Social Forces*, 32: 3, pp. 226 - 235
24. Giddens, Anthony 1990, *The Consequences of Modernity*, Polity Press, United Kingdom
25. Good, Mary-Jo Delvecchio 1995, "Cultural Studies of Biomedicine: An Agenda for Research", *Social Science and Medicine*, Vol. 41, No. 4, pp. 461 - 473
26. Gupta, Dipankar 2000, *Mistaken Modernity: India Between Worlds*, HarperCollins Publishers India, New Delhi
27. Gupta, Dipankar 1988, "For a Sociology / Anthropology of Illness: Towards a Delineation of its Disciplinary Specificities", *International Sociology*, Vol. 3, No. 4, pp. 403 - 413
28. Habermas, Jurgen 1985, *The Philosophical Discourse of Modernity*, Twelve Lectures, Translated by Frederick Lawrence, Polity Press, Cambridge
29. Hari, P 2002, "The Millennium Initiative" *Businessworld*, (1 July), pp. 44 – 50
30. Jaggi, O. P 1974, *A Concise History of Science*, Atma Ram & Sons, Delhi
31. Jaggi, O. P 2000, "Medicine in India: Modern Period" in D.P Chattopadhyaya (gen. ed) *History of Science, Philosophy and Culture in Indian Civilization*, Oxford University Press, Delhi
32. *Journal of Research in Ayurveda and Siddha*, 2001, Vol. XXII, No. 3 – 4, (July – Dec)
33. *Journal of Research in Ayurveda and Siddha*, 1996, Vol. XVII, No. 1 - 2, (Jan – June)
34. *Journal of Research in Ayurveda and Siddha*, 1988, Vol. IX, No. 1 & 2, (March – June)
35. *Journal of Research in Indian Medicine*, 1975 , Vol. X, No. 3, (September)

36. *Journal of Research in Indian Medicine*, 1969, Vol. IV, No. 1
37. Kuhn, Thomas S 1962, *The Structure of Scientific Revolutions*, Foundations of the Unity of Science, Vol. II, No. 2, International Encyclopaedia of Unified Science, University of Chicago Press, Chicago
38. Kumar, Deepak 2001, "Introduction" in Deepak Kumar (ed.) *Disease and Medicine in India: A Historical Overview*, Tulika Books, India
39. Kumar, Deepak 2001, "Science and Society in Colonial India: Exploring an Agenda", *Science, Technology and Society*, 6 : 2, pp. 375 – 393
40. Lash, Scott 1999, *Another Modernity: A Different Rationality*, Blackwell Publishers, UK & USA
41. Latour, Bruno 1987, *Science in Action*, Harvard University Press, Cambridge
42. Lele, R. D 1986, *Ayurveda and Modern Medicine*, Bharati Vidya Bhavan, Bombay
43. Leslie, Charles 1998, (ed.) *Asian Medical Systems: A Comparative Study*, Motilal Banarasidass Publishers Pvt. Ltd., Delhi
44. Leslie, Charles 1973, "The Professionalizing Ideology of Medical Revivalism" in Milton Singer (ed.) *Entrepreneurship and Modernization of Occupational Cultures in South Asia*, Durham
45. Leslie, Charles and Allan Young 1993, (eds.) *Paths to Asian Medical Knowledge* Munshiram Manoharlal Publishers Pvt. Ltd., 'Science, Experimentation and Clinical Practice in Ayurveda'
46. Lévinas, Emmanuel 1998, *Entre Nous: Essays on Thinking of the Other* Translated by Michael B. Smith and Barbara Harshav, Columbia University Press
47. Madan, T. N 1980, in collaboration with Paul D Weibe, Rahim Said, Malsiri Dias *Doctors and Society: Three Asian Case Studies – India, Malaysia, Sri Lanka*, Vikas Publishing House Pvt. Ltd., Ghaziabad, UP
48. Madan, T.N 1969, "Who Chooses Modern Medicine and Why", *Economic and Political Weekly*, (September 13), pp. 1475 - 1483

49. Mannheim, Karl 1929, *Ideology and Utopia: An Introduction to the Sociology of Knowledge*, Routledge and Kegan Paul Ltd., London
50. McKee, Janet 1988, "Holistic Health and the Critique of Western Medicine" *Social Science and Medicine* Vol. 26, No. 8, pp.775 – 784
51. Merton, Robert K 1973, *The Sociology of Science: Theoretical and Empirical Investigations*, The University of Chicago Press, Chicago
52. Meulenbeld, Jan and Dominik Wujastyk 2001, (ed.) *Studies on Indian Medical History*, Reprint Edition, Motilal Banarasidass Publishers Pvt. Ltd.
53. Novey, Donald W 2000, *Clinician's Complete Reference to Complementary and Alternative Medicine*, Mosby, Inc.
54. Parsons, Talcott 1939, "The Professions and Social Structure", *Social Forces*, Vol. 17, No. 4, (May), pp. 457 - 467.
55. Paty, Michel 1999, "Comparative History of Modern Science and the Context of Dependency", *Science, Technology and Society*, 4: 2, pp. 171 - 204
56. Payer, Lynn 1988, *Medicine and Culture: Varieties of Treatment in the United States, England, West Germany and France*, Penguin Books, USA
57. Porter, Roy 1995, *Disease, Medicine and Society in England 1550-1860*, New Studies in Economic and Social History, Second Edition, Cambridge University Press, London
58. Quaiser, Neshat 2000, "Colonial Politics of Medicine and Popular Unani Resistance", *Indian Horizons*, Vol. 47, No. 2, (April – June), pp. 29 - 42
59. Radhakrishnan, M. G 2002, "Man for All Cures", *India Today*, (March 4), p. 51
60. Sahni, P and S Nundy 1994, (ed) *Medical Books in India*, National Book Trust, India
61. Samson, Colin 1999, (ed.) *Health Studies: A Critical Cross-Cultural Reader*, Blackwell Publishers, USA
62. Sarma, S. R 2001 Book Review – "Beyond Joseph Needham: Science, Technology and Medicine in East and Southeast Asia", *Indian Journal of History of Science*, 36. 3 – 4, pp. 161 - 166

63. *Select Research Papers on Evidence based Drugs in Ayurveda*, 2001, Department of Indian Systems of Homeopathy, Ministry of Health and Family Welfare, Government of India, New Delhi
64. Singer, Milton 1973, "Introduction" in Milton Singer (ed) *Entrepreneurship and Modernization of Occupational Cultures in South Asia*, Durham
65. Sivarajan, V.V and Indira Balachandran 1994, *Ayurvedic Drugs and their Plant Sources*, Oxford and IBH Publishing Company Private Ltd., Delhi
66. Sontag, Susan 1989, *Illness as Metaphor and Aids and its Metaphors*, Anchor Books, Doubleday, New York
67. Srivastava, Deep Mala 1996, *A Study in Medical Sociology*, Radha Publications, New Delhi
68. Subbaram, K. N 1998, *Reason Revisited: In Relation to Science, Secularism and Democracy*, Harman Publishing House, New Delhi
69. Tucker, Vincent 1996, "Health, Medicine and Development: A Field of Cultural Struggle", *The European Journal of Development Research* (Cultural Perspectives on Development) Vol. 8, No. 2, (Dec.) pp. 110 - 128
70. Thakur, Vijay Kumar 2001, "Surgery in Early India: A note on the Development of Medical Science" in Deepak Kumar (ed.) *Disease and Medicine in India: A Historical Overview*, Tulika Books, India
71. Udupa, K. N 1979, "The Present Status of Research in Ayurveda" in Pandit Shiv Sharma (ed.) *Realms of Ayurveda: Scientific Excursions by Nineteen Scholars*, Arnold-Heinemann, India
72. Udupa, K.N 1985, *Promotion of 'Health for All' by Ayurveda and Yoga*, Tata Printing Works, Varanasi
73. Wagner, Peter 1994, *Sociology of Modernity, Liberty and Discipline*, Routledge, London
74. Wallace, Walter 1971, *The Logic of Science in Sociology*, Aldine and Atherton, Chicago

75. Wardwell, Walter I 1994, "Alternative Medicine in the United States" *Social Science and Medicine*, Vol. 38, No.8, pp.1061-1068
76. Weber, Max 1946, "Science as a Vocation", in *From Max Weber: Essays in Sociology*, Translated by H. H Gerth and C. W Mills, Oxford University Press, New York
77. Williams, S.J. 1997, "Modern Medicine and the Uncertain Body: From Corporeality to Hyperreality", *Social Science and Medicine*, 45 (7), pp. 1041 - 9
78. Young, Allan 1976, "Some implications of medical beliefs and practices for social anthropology", *American Anthropologist*, Vol. 78, p. 5 - 24

Documents and Reports

1. *Annual Report 2001-02*, Ministry of Health and Family Welfare, Government of India, New Delhi
2. *Annual Report 1999-2000*, Ministry of Health and Family Welfare, Government of India, New Delhi
3. *Annual Report 1993-94*, Ministry of Health and Family Welfare, Government of India, New Delhi
4. *Annual Report 1978-79*, Ministry of Health and Family Welfare, Government of India, New Delhi
5. *Annual Report 1976-77*, Ministry of Health and Family Welfare, Government of India, New Delhi
6. *Annual Report 1975-76*, Ministry of Health and Family Welfare, Government of India, New Delhi
7. *Central Register of Indian Medicine, 2000*, Central Council of Indian Medicine, New Delhi
8. *Ethical Guidelines for Biomedical Research on Human Subjects, 2000*, Indian Council of Medical Research, New Delhi

9. *First Five-Year Plan, 1952*, Planning Commission, Government Of India, New Delhi
10. *Health Information of India 1995-96*, Central Bureau of Health Intelligence, Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India, New Delhi
11. *ICMR's Initiatives in Traditional Medicine*, Unpublished Draft, Indian Council of Medical Research, New Delhi
12. *Indian Systems of Medicine and Homeopathy in India*, 1991, Ministry of Health and Family Welfare, Government of India, New Delhi
13. *Indian Systems of Medicine and Homoeopathy in India*, 2003, Ministry of Health and Family Welfare, Government of India, New Delhi
14. *List of State-wise number of Practitioners of Indian Systems of Medicine, 2001-02*, Central Council of Indian Medicine, New Delhi
15. *Minimum Standards and Requirements for Ayurvedic Colleges and Attached Hospitals*, Central Council of Indian Medicine, New Delhi
16. *Publication Catalogue 2001*, Central Council for Research in Ayurveda and Siddha, Indian Systems of Medicine and Homeopathy, Ministry of Health and Family Welfare, Government of India, New Delhi
17. *Report on Medical Colleges and Teaching Hospitals, 1964*, Committee on Plan Projects, Building Projects Team, New Delhi
18. *Report of the Committee on Indigenous Systems of Medicine Vol. I: Report and Recommendations*, 1948, Ministry of Health, Government of India, New Delhi
19. *Report of the Committee on Indigenous Systems of Medicine Vol. II: Appendices*, 1948, Ministry of Health, Government of India, New Delhi
20. *The Ayurvedic Pharmacopoeia of India Part I, Vol. III*, 2001, Ministry of Health and Family Welfare, Government of India, New Delhi
21. *The Use of Essential Drugs*, Report of a WHO Expert Committee, 1983, WHO, Technical Report Series 685 Geneva

