

# Tibetan Medicine

## A Complementary Science of Optimal Health

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Traditional medical systems are challenging because their theories and practices strike many conventionally trained physicians and researchers as incomprehensible. Should modern medicine dismiss them as unscientific, view them as sources of alternatives hidden in a matrix of superstition, or regard them as complementary sciences of medicine? We make the latter argument using the example of Tibetan medicine. Tibetan medicine is based on analytic models and methods that are rationally defined, internally coherent, and make testable predictions, meeting current definitions of “science.” A ninth century synthesis of Indian, Chinese, Himalayan, and Greco-Persian traditions, Tibetan medicine is the most comprehensive form of Eurasian healthcare and the world’s first integrative medicine. Incorporating rigorous systems of meditative self-healing and ascetic self-care from India, it includes a world-class paradigm of mind/body and preventive medicine. Adapting the therapeutic philosophy and contemplative science of Indian Buddhism to the quality of secular life and death, it features the world’s most effective systems of positive and palliative healthcare. Based on qualitative theories and intersubjective methods, it involves predictions and therapies shown to be more accurate and effective than those of modern medicine in fields from physiology and pharmacology to neuroscience, mind/body medicine, and positive health. The possibility of complementary sciences follows from the latest view of science as a set of tools—instruments of social activity based on learned agreement in aims and methods—rather than as a monolith of absolute truth. Implications of this pluralistic outlook for medical research and practice are discussed.

**Key words:** Tibetan medicine; integrative medicine; health education; humoral medicine; philosophy of medicine; history of medicine

### Introduction

The term “alternative medicine” has come to mean any healthcare remedy or system not generally accepted in modern biomedicine,<sup>1</sup>

from Swedish massage to homeopathy, from macrobiotics to the traditional Asian systems of medicine.<sup>2</sup> Although many patients use forms of alternative medicine,<sup>3</sup> either alone or with conventional biomedicine, physicians and researchers in the past have tended to be skeptical of all “unconventional” healthcare. Yet, as evidence of the widespread popularity of many of these alternatives has surfaced, along with documentation of the billions spent on them,

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interest within the biomedical community has risen. The current consensus is that assessment of the safety and efficacy of at least some of these alternatives is warranted. Gradually, reliable studies are showing some remedies effective—such as acupuncture for nausea<sup>4,5</sup>—while flagging others as potentially dangerous.<sup>6</sup> The Office of Alternative Medicine at the National Institute of Health was created expressly to help the medical community meet the challenges posed by this new field of clinical research.

Beyond the isolated herbal remedy or unconventional technique, the greatest challenge to conventional scientific models and methods comes from the alternative systems of healthcare, especially the traditional systems of China, India, and Tibet.<sup>7</sup> Unlike modern alternatives to biomedicine from the West, these Asian traditions are more comprehensive in nature and scope, with complete systems of theory, practice, education, and training that have enabled them to withstand the centuries.<sup>8,9</sup> These systems pose the biggest challenge to Western physicians and researchers not just because they are more complete than modern alternatives such as homeopathy, but also because, like homeopathy, they involve systems of theory and practice that strike many as unscientific or just plain nonsense.<sup>10</sup>

The growing popularity of Asian healthcare traditions in the United States (U.S.) poses many challenging questions. If these traditions are mere nonsense to be exposed and suppressed, how do we go about doing so without studying them in their entirety? Alternatively, if some of the remedies and techniques hit upon by traditional doctors might hide effective elements within an irrational system, how do we separate the therapeutic gold from the fool's gold of pre-scientific beliefs and practices? Finally, is it possible that Asian healthcare traditions, properly approached, may have something to contribute as coherent systems to modern medicine? If so, the most difficult challenge ahead may not be how to expose or mine the Asian medical traditions, but how to go about scientifically studying and translating them as

coherent systems of theory and practice fundamentally different from modern biomedicine and its modern Western alternatives.<sup>11,12</sup>

In this article we explore the latter view, presenting the most challenging argument for the potential contribution of traditional healthcare, using the example of Indo-Tibetan medicine. Applying the lessons learned in this century by our colleagues in physics, we argue that no one medical model, however evidence-based or effective, is absolutely preferred; that no one clinical or research paradigm is best fit for all aspects of all healthcare problems. Rather, as modern quantum physics is now accepted and used every day alongside classical mechanics, we propose that the future of modern medicine lies in developing complementary paradigms that give clinicians and researchers a broader spectrum of approaches to the complexity of human health and disease. Finally, we argue that traditional medical systems, properly understood, are the best extant examples of such paradigms.

### **The Special Case of Indo-Tibetan Medicine**

Historically, Tibetan medicine is the traditional system of healthcare developed in Tibet in the eighth to ninth century of the common era (C.E.). A synthesis of Indian, Chinese, Central Asian, and Greco-Persian traditions, Tibetan medicine was unified into a single system using theories and methods from Indian Buddhist mind and health science to create what is the world's first system of integrative medicine.<sup>13</sup> At the hub of Eurasia and East-West exchange, Tibet attracted some of the most eminent physicians from neighboring civilizations to gather and systematize the world's medical knowledge and techniques.<sup>14</sup> Consequently, Tibetan medicine is the most comprehensive system of classical Eurasian medicine, integrating methods ranging from nutrition, acupuncture, and herbal pharmacology to yoga and meditation.<sup>15</sup> Finally, because Tibet

remained isolated until the Chinese invaded in 1959 and consistently worked to develop its system and institutions of healthcare, Tibetan medicine is the best preserved example of these medical traditions.<sup>9</sup>

Following the Indian Buddhist scientific tradition, Tibetan medicine rejected the authority of tradition, revelation, and scripture, while accepting the ultimate validity only of inference (Skt. *anumāna*=Tib. *rjes-dpak*) and evidence (*pratyakṣa*=*mngon-sum*).<sup>16,17</sup> In this tradition, by the sixth century B.C.E., the analytic use of the zero and algebraic variables was known and the empirical possibility of any soul, mind, or vital principle independent of physical energy (*prāṇa/vāyu=rlung*) and laws of causality (*hetu-phala=rgyu-'bras*) had been ruled out.<sup>18</sup> By the first century C.E., the possibility of an indivisible atom or elementary particle (*paramāṇu*=*'dul-phra-rab*) had been ruled out; all particles were known also to have wave-like, space-like, and energetic properties supporting changes between five elementary states (*mahābhūta*=*'byung-pa-chen-po*) of matter—solid, liquid, gas, energy, and space or information (*rūpa, ambu, vāyu, agni, ākāśa/vijñapti=sa, chu, me, rlung, nam-mkha/nam-rig*).<sup>19</sup> At the same time, the universal relativity (*pratītyasamutpāda=rten-cing 'brel-bar'byung-ba*) of all science and method had been conclusively established.<sup>18</sup> Although the Indo-Tibetan scientific tradition anticipated discoveries not replicated in the modern West until this century, its analytic method remained primarily qualitative, relying on the five senses aided only by educated inference and empirically validated rational intuition (*yuk-tijñāna=rig-pa'i-ye-she*). In fact, this tradition has viewed the mind and central nervous system as a powerful sixth sense capable of an intuitive mental perception (*manasa-pratyakṣa=yid kyi mngon sum*) that could be further developed through discursive learning and practical experience into fully conscious and self-regulated mental perception (*yogi-pratyakṣa=rnal-'byor ba'i mngon-sum*).

Synthesizing Ayurvedic Indian and Chinese traditions, Tibetan physiology analyzes the

body into four levels, defining three aspects of systemic self-organization (*doṣa=nad*); eleven organ systems (Ch. *liu-fu-wu-zang* = tib. *don-nod*); seven tissue elements (Skt. *dhātu*=Tib. *zung*); and five biomolecular elements (*adhyātma-bhūta=nang-gi-'byung-po*) linked to the five states of inorganic matter mentioned above.<sup>20,21</sup> While the elemental analysis of organ systems into tissue elements and biomolecular elements needs no explanation, the systems analysis of physiological self-regulation derived from the Indian three aspect (*tridoṣa*) model is routinely misunderstood.<sup>22,23</sup>

Given the Indo-Tibetan definition of health as the homeostasis (*svasthā=rang-gnas*) of inner and outer systems and elements, physiology is defined by order (*prakṛti=rang-bzhin*) and pathology by disorder (*vikṛti=nam-byed*). Systemic order and disorder are characterized in terms of three aspects of psychophysical self-organization (*ahamkāra=ngar-'dzin*). Although the mind and body have one actuality (*ekabhāva=ngo-gcig*), by convention, their whole spectrum of functioning is described using a range of correlated physiological and psychological terms.<sup>24</sup> In reference to physiology, three main aspects of self-organization are distinguished to highlight the three functional modes we translate as *activity*, *vitality*, and *stability*. These are typically misunderstood as reducible to the substances that exemplify and symbolize them, namely “wind,” “bile,” and “phlegm” (*vāta, pitta, kapha=rlung, mkhris-pa, bad-kan*).<sup>25</sup> Instead, they may best be conceived as discrete aspects of a continuous field of energetic and subtle material processes (*sūkṣma-rūpa=phra-mo gzugs*) that comprises the whole spectrum of mind/body functioning in health and illness. While they refer to molecular events, these are also expressed in gross, systemic patterns that may be discerned by observable features of body and mind. In theory and practice, then, the language of three psychosomatic aspects serves as a typology for the qualitative description of elemental and systemic processes, functions, and structures. At the gross level the aspect of activity (*rlung*), for

instance, refers to the central regulatory function of the nervous system, analyzed into ten forms of activity, the five most basic of which are vital-conscious, respiratory-expressive, digestive-metabolic, excretory-reproductive, and motor-proprioceptive. Similarly, at the gross level the aspect of vitality (*mkhris-pa*) refers to the functions of the digestive system and metabolism, while stability (*bad-kan*) describes the structure of connective tissues and the musculoskeletal system. Finally, elemental analysis and systems analysis are effectively integrated in Indo-Tibetan physiology by linking the aspects of self-organization with specific organ systems, tissues, and elements, allowing doctors to qualitatively describe the reversible interactions connecting all levels in health and disease. For instance, the aspect of stability (*bad-kan*) is linked with the heart, with muscle and connective tissue, and with compounds stable in liquid and solid states. At the subtle level, activity or wind refers to the vital-conscious energies (*prāṇa-vāyu=srog-'dzin rlung*) operating within the central nervous system (*mādhyama-nadī-cakra=dbu-ma'i-rtsa-'khor*); vitality or bile to the neuroendocrine drops (*bindu=thig-le*) flowing within channels and complexes (*nadī-cakra=rtsa-'khor*) of that system; and stability or phlegm to the central neural channels and complexes themselves.

This analysis of systemic self-organization in the Indo-Tibetan tradition permits a direct linkage of physiology to psychology that makes this medical model well suited to psychosomatic and behavioral medicine. Although most directly involved with the activity of neural energy or wind, all levels and functions of the mind interact with all three aspects of somatic self-organization. Anticipating theories in current neuropsychiatry, mind and body are considered empirically identical though observationally distinct (*ekabhāva-vyāvrttibheda=ngo-gcig-ldog pa tha dad*). Consequently, the somatic aspects of activity, vitality, and stability are seen as empirically inseparable from and observationally correlated with psychological aspects of attachment, aggression, and self-involvement (*rāga,*

*dveṣa, moha=‘dod-chags, khong-gro, gti-mug*), as well as obsessive, compulsive, and addictive types of disease-prone personality.<sup>20</sup>

Given this systemic psychophysiology Buddhist pathology looks beyond the immediate precipitants and mechanisms of disease to the behavioral and psychosomatic factors which impair self-organization and make people disease-prone. Thus, pathogens such as parasites (*kirmi=sim-bu*), microorganisms (*kirmika=sim-bu-nyid*), and trauma are considered not as primary etiologies but as risk factors similar to unhealthy diet, lifestyle, and environment. The primary preventable causes of disease are the obsessive, compulsive, and addictive patterns of stress-reactive behavior that make people disease-prone, along with the cognitive-perceptual habits and emotional states of attachment, aggression, and self-involvement reinforcing them.<sup>20,26</sup> For example, someone goal-directed who tends to aspire and be attached to wealth or status is at risk for an obsessive disorder and prone to diseases caused by excess activity (*rlung*) such as insomnia, colitis, and traumatic accidents. Someone extroverted who tends toward anger and hostile interactions is at risk for a compulsive disorder and prone to diseases of excess vitality (*mkhris-pa*) such as gastrointestinal ulcers and recurrent infections. Someone introverted who tends to project or deny responsibility is at risk for static-addictive disorder and prone to diseases of excess stability or stasis (*bad-kan*) such as obesity, diabetes, and atherosclerosis. These three modes of behavioral pathogenesis have a common mind/body mechanism: the twelve-fold cycle of stress (*dukkha=‘dung-ngal*) driven by stress-reactive emotions and actions (*kleśa-karma=nyon mongs-las*) that makes beings prone to traumatic illness, aging, and death.

Diagnosis in Tibetan medicine is reached by four methods.<sup>26</sup> It begins with a comprehensive clinical interview that consists of history taking and physical examination. The patient is interviewed to clarify symptoms, behavior, lifestyle, and mindset. The general condition of

the body is observed, with special attention to the affected part and to the tongue, examined for color, coating, and texture. The radial artery pulses are then examined with a system of pulse diagnosis that assesses not only gross rate and rhythm but also subtle pulse properties, using an elaborate qualitative schema to categorize pulses by variability, contour, power, and density. Distinct from Ayurvedic and Chinese pulse diagnosis, this system is so sensitive and reliable that some researchers have attempted to adapt its qualitative schema to modern technology using software programs for pulse recognition aided by mechanical pulse transducers.<sup>27,28</sup> Finally, urine is analyzed for taste, smell, color, bubbles, steam, and sediment. Tibetan medicine includes the most comprehensive system of traditional urinalysis, integrating Greco-Persian, Indian, and Chinese methods with indigenous practices.<sup>29</sup> Further testing of the urine for reactions caused by the addition of certain herbs is another important aspect in differential diagnosis. The data are weighed together to establish the patient's constitutional baseline as well as to diagnose current disorder and infer pathogenesis.<sup>8</sup>

Given the Tibetan model of health and disease as a biopsychosocial balance, treatment in this system ideally consists of multiple noninvasive interventions, fostering self-care through behavior and lifestyle change.<sup>24</sup> A typical treatment integrates medical management of the disease with health education directed at any underlying behavioral and/or psychosomatic disorder.<sup>12</sup> Medical management is prescribed in a hierarchy from least to most invasive. The first line of treatment involves nutrition and behavioral therapy. If this fails the second line involves pharmacotherapy, usually in the form of multi-component herbal pills, although more rapidly absorbed herbal suspensions may be given when indicated. If this fails, the third line may consist of three kinds of interventions: detoxifying treatments of five kinds including emetics, cathartics, and baths; somatic treatments including massage or acupuncture; and finally moxabustion. If all else fails, in the-

ory surgery is the last resort, although in practice Tibetans discontinued it centuries ago. Behavioral treatment usually includes counseling and psycho-education using yoga and meditative techniques. Medical and behavioral care is integrated via the qualitative language of systemic and elemental analysis that allows the physician to educate the patient about lifestyle and mindset.<sup>23</sup> This seamless integration of somatic and behavioral treatment makes Tibetan medicine a rare paradigm of the integration of acute intervention with rehabilitative and preventive care. This integration is facilitated by the qualitative nature of Tibetan medical language and methods, a feature which may seem unscientific but in fact makes this system unusually friendly to patient education and behavior change. For example, the nutritional analysis of foods in terms of the five states (here rendered literally as earth, water, fire, air, and space) is linked both to the systemic disorder being treated and to an art of qualitative analysis of nutritional content by taste. People with a static-addictive disorder causing diabetes or atherosclerosis are taught to avoid sweet and sour foods linked to earth and water elements (which act to increase the aspect of stability) and to eat sharp, bitter, or flat foods linked to fire, air, and space elements (which act to increase the aspects of activity and vitality). The active ingredients and effects of herbs are also categorized so as to be readily assessed by taste, although herbs are usually given in sophisticated multi-component compounds designed to simultaneously treat disorders, restore balance, and control side effects.<sup>14</sup> A more complex analytic scheme of twenty qualities also linked to the elements is used to describe and teach how various behavior patterns, environmental factors, and stimuli affect certain disorders. For instance, obsessives who tend to be thin and restless are generally taught to avoid running, exposure, and distracting stimuli, especially in cold, clear, and dry seasons or climates, because these make them prone to disorders of the activity aspect like arthritis or insomnia. Compulsives who tend toward aggression are prone to

disorders of the vitality aspect including heart disease, and are given cognitive schemes and meditative techniques that decrease compulsion and increase relaxation. Finally, behavioral treatment is integrated using the linkage between psychosocial disorders and somatic conditions. Specific modes of thought, reflection, and meditation are prescribed to reform mental habits causing psychosomatic disorders that make people prone to certain diseases. Given its full integration of Indian traditions of yoga and meditation, Tibetan medicine includes one of the world's most complete and effective systems of mind/body medicine.

As a final note, the theory and practice of Tibetan medicine and psychiatry are also fully integrated with the therapeutic philosophy and contemplative science of Indian Buddhism. Given this contemplative dimension, Tibetan medicine defines normal physical and mental health as disorders, relative to the optimal physical and mental health of a fully enlightened and self-regulating being. In this sense, effective medical and psychiatric treatment are not seen as ends in themselves, but rather as potential gateways to a gradual path (*pathakrama-lam-rim*) of mind/body self-mastery that results in extraordinary levels of longevity, happiness, personal freedom, and creative integration. Although this remarkable tradition of positive healthcare involves increasing levels of discipline and commitment that may not suit everyone, it has also been distilled into accessible popular practices meant to increase the meaning and quality of everyday life and death. This final dimension of Tibetan medicine makes it the world's most systematic and rigorous system of positive and palliative healthcare.

## Discussion

In reviewing the case of Tibetan medicine, we presented some of the reasons and evidence for suggesting that Asian traditional systems of healthcare may be more usefully

approached as sources for a complementary medical paradigm than as nonsense or raw material. Tibetan medicine is based on analytic models and empirical methods that are rationally defined, internally coherent, and yield testable predictions. In fact, some of the predictions and methods have been validated by modern research methods. For instance, the finding that a mindset of self-involvement is the single most significant risk factor for mortality due to myocardial infarction in coronary artery disease<sup>30</sup> is not only easy to explain but eminently predictable given the Indo-Tibetan paradigm, while it remains anomalous in the modern paradigm. Likewise, the finding replicated in several placebo-controlled double-blind trials<sup>31-34</sup> that a multi-component Tibetan herbal formula called Padma 28 is nearly twice as effective in peripherovascular disease as pentoxifylline and nefidrofuryl yet associated with minimal to no significant side effects is what Indo-Tibetan medicine would predict,<sup>14</sup> although it clearly challenges the current biomedical paradigm. Similar surprises may be emerging from promising research on Tibetan medical treatments in a wide range of conditions, including internal medicine,<sup>35</sup> cardiology,<sup>36</sup> pulmonology,<sup>37-39</sup> gastrointestinal medicine,<sup>40</sup> infectious disease,<sup>41-47</sup> oncology,<sup>48-53</sup> neuropsychiatry,<sup>54-57</sup> rheumatology,<sup>58,59</sup> urology,<sup>60</sup> rehabilitation medicine,<sup>61-63</sup> dermatology,<sup>64,65</sup> and palliative care.<sup>66</sup> Although only 4 of the 145 studies reviewed for this paper were conducted in the U.S., the results from the European, Russian, Indian, and Chinese research communities more familiar with Tibetan medicine are compelling and suggest enormous potential contributions for future study.

Apart from the surprising predictive power and therapeutic efficacy of Tibetan medicine, another whole area of potential contributions stems from the nature of its predictive and therapeutic methods. As Western clinicians and researchers increasingly come into contact with Tibetan medicine and psychiatry, they are often surprised by the ability their Tibetan

colleagues have to arrive at precise or obscure diagnoses using nothing but their unaided minds and senses.<sup>8</sup> Given the enormous expense and risk of our laboratory-based diagnostic methods, the noninvasive, nonmechanical nature of Tibetan diagnostic procedures raises the possibility of reducing our dependence on medical technology and facilitating medical outreach to the underserved. A similar promise follows from Tibetan methods of recognizing, preparing, and compounding herbal treatments based on natural methods of analysis like taste. As the efficacy of herbal treatments for various conditions is established, Tibetan pharmacology may prove useful in helping identify and prepare sustainable local alternatives to expensive or unavailable Western pharmaceuticals, especially in third world nations faced with a widening gap between escalating medical costs and public health epidemics. In addition to offering a diagnostic technology appropriate to the human body and senses, the embodied nature of Tibetan medical practice has profound implications for therapeutics as well. In this tradition, both diagnosis and treatment are viewed as cultivated expressions of the natural social behavior in which humans and other mammals understand and tend to pains within others' bodies and minds. As in Western psychotherapy, medical and psychiatric care in the Indo-Tibetan Buddhist tradition is seen as taking place within an interpersonal field which culturally replicates and extends the natural empathic bond between parents and children.<sup>9</sup> And, as in psychotherapy training, the capacity to sustain this interpersonal field is not given mere lip service or left to chance but cultivated by extensive training in contemplative and ethical skills aimed at building positive social emotions of unconditional compassion and empathy.<sup>24</sup> In a sense, this deeply human approach to healthcare makes a medical science and art of cultivating a natural healing response to positive social attention and contact, as in animal models of learning enrichment. And, as in Western psychotherapy, it puts this response to good use in supporting the health educa-

tion, rational compliance, and healthy behavior change that are crucial to long-term rehabilitation, prevention, and positive health. Finally, beyond the promise of extensive, diverse contributions, especially in mind/body medicine and pharmacology, Tibetan medicine offers a range of critical, time-tested paradigms for the essential new disciplines of integrative, rehabilitative, preventive, positive, and palliative healthcare.

Given the enormous potential contributions of Tibetan medicine, it would seem a highly promising new field for research in the West. Yet since its models, methods, and predictions are systemic and qualitative rather than reductive and quantitative, this system of healthcare and its paradigm of theory and practice nonetheless do not seem "scientific" in the modern sense. In fact, it would seem that its models, methods, and predictions differ so dramatically from those of conventional Western medicine that the Indo-Tibetan paradigm must be completely incompatible with the biomolecular paradigm of modern medicine. However, this skepticism about Tibetan medicine assumes an unexamined, exclusivist premise: that there can be one and only one objectively and empirically valid system of science and medicine.

By the mid-1970s, the objectivist view of science and inductivist view of method underlying this premise had been abandoned by historians and philosophers of science as a result of a decades-long debate over the scientific implications of the principles of relativity and uncertainty in modern physics.<sup>67</sup> The consensus they reached still stands. Currently, no scientific knowledge or method is considered objective or empirically valid in the exclusive, positive sense assumed in the view received from the last century.<sup>68</sup> Theory, method, and observation are all mutually dependent and coherent only insofar as they have not yet been proven false in the consensus of the scientific community.<sup>69</sup> Like sense perception, science is inexorably relative to some human frame of reference, including limited means of gathering evidence and arbitrary sociocultural conventions for evaluating and using that evidence.<sup>70</sup> Science may be the

most universal or objective product of our cultural activity, but it is nonetheless a cultural product, relative to the aims and interests of human individuals and groups.<sup>71,72</sup> It is not the case, for instance, that physicians studying cancer have made an infinite number of observations. They make large numbers of observations based on theoretical presuppositions about what sort of things influence the body.

Indeed, if scientific knowledge and methods are not absolute, then modern medicine eventually must begin to consider a more relativistic view of science,<sup>73</sup> as have some of our colleagues in the basic sciences such as physics and neuroscience.<sup>74,75</sup> Much has been made of the interest physicists have taken in Asian scientific traditions because certain theories developed in ancient India, Tibet, and China, appear comparable with those of modern physics.<sup>76</sup> Yet beneath such surface resemblances, the interest physicists have shown in cross-cultural scientific comparisons is based on what historians of science call the “revolution” in modern physics, a shift not just from one monolithic paradigm to another but from one view of science to another.<sup>77,78</sup> The 19th century view of science as limited to one monolithic paradigm gave way in the last century to a relativistic view in which science is free to use apparently incommensurate paradigms for different purposes. Quantum mechanics has not replaced the Newtonian paradigm but is taught alongside and is still routinely used when more useful or convenient.

The current view of science as a tool—an instrument of social action based on learned agreement in language, aims, and practice—has the logical consequence that more than one valid science is possible and may be desirable, as are multiple tools. It may no longer be scientifically necessary to dismiss those stubborn facts or problems poorly handled in one paradigm as intrinsically unfit for scientific study, like random noise or superstitions. Given another scientific frame of reference, anomalies may be seen as coherent evidence of the relativity of the normal scientific model and practice to a

culturally specific research program, suggesting that a complementary paradigm better suited to those problems may be worth developing.

As physics has historically been the vanguard of advancement in modern science, the rate-limiting step in the development of a coherent complement to current biomedicine may well be the spread of the new physics’ revolutionary pluralism to the life and health sciences. As we move beyond a monolithic view of science, the idea that one medical model fits all healthcare problems may come to seem as naive as our predecessors’ talk of “black bile” or prescription of bleeding.

In our view, even a cursory look at Indo-Tibetan medicine challenges the conventional wisdom of dismissing traditional systems of healthcare as placebo systems to be debunked or goldmines for new drugs. Instead, we argue that they may be most reasonably and usefully studied as alternate theoretical and practical frames of reference for approaching problems to which current biomedical models and methods may be ill suited. In particular, we see them as applicable to the family of problems where the mechanistic models, invasive diagnostics, and manipulative treatments of conventional biomedicine have a high cost and limited benefit, and where better, more cost-effective outcomes may result from models and methods that help patients change their mindset, behavior, and lifestyle. We call the alternative/complementary paradigms that best support noninvasive and palliative care, rehabilitation and prevention, mind/body and positive health, “noninvasive” or “self-care” paradigms and the current biomedical model best suited to manipulative medical-surgical intervention an “invasive” or “allo-care” paradigm.

## Conclusions

In this article we have made three points about traditional Eurasian medicine, based on the case of Indo-Tibetan medicine: (1) that

traditional medical systems may be most usefully approached as paradigms of complementary medicine, (2) that we may best understand and study them as such by following the example of scientific pluralism set by modern physics, and (3) that studying traditional systems of medicine on their own terms is likely to be both more challenging and valuable for modern scientific medicine than limiting our efforts to debunking or mining them for alternatives.

The case of Indo-Tibetan medicine suggests that traditional medical systems pose a greater challenge and hold more potential than many modern Western forms of alternative medicine because they are more comprehensive systems based on more complex models and methods. In the current debate between conventional and unconventional forms of modern Western medicine, the ancient Asian traditions may offer a middle way or common sense middle ground, lending one or another “side” the weight of cross-cultural and historical validation. Tibetan medicine may be especially valuable in this, because it represents the strain of Eurasian traditional medicine least influenced by interaction with biomedicine or its modern Western alternatives. Of note, Tibetan medicine may also prove especially valuable here because its relativistic view of scientific knowledge and method has proven open and flexible enough to integrate Ayurvedic, Chinese, Central Asian, and Greco-Persian traditions and to be accepted across a wide range of human societies and cultures.

The ability to take full advantage of our growing exposure to traditional medicine is limited by the conventional view that modern biomedicine is the only system of healthcare based on objective knowledge and empirically verifiable methods, i.e., the only possible form of scientific medicine. As proponents of evidence-based medicine today point out, much of what clinicians say and do every day is based on education, training, and shared experience (i.e., on a modern tradition) rather than on well-designed and well-conducted research.

Yet this is not taken to mean that the medicine we know and practice is unscientific. Instead, we expect most of what we think and do will eventually be supported by research, and have learned to stay open to ongoing corrections and advances that might improve outcomes. This attitude is typical of what Thomas Kuhn called “normal science,” in which the paradigm at the foundation of all our theory and practice never comes into question. Only at the edges of current knowledge and mastery, in the realm of what he called “extraordinary science,” are we free and obliged to ask if and how what we normally know and do may somehow be partial, misleading, or ineffective for certain kinds of problems.<sup>79</sup> Even in this context, we can hardly abandon conventions of logic and evidence, but can only try to be more open to the unthinkable and more curious about the impossible. This attitude of extraordinary open-mindedness is what is called for at least some of the time in trying to understand and study traditional medicine.<sup>80,81</sup> In approaching Tibetan medicine, for instance, it helps to reflect that the systemic models and qualitative methods that strike us as most blatantly unscientific are precisely what make it well suited to explain and do things modern biomedicine explains and does poorly, if at all. Also, it helps to recall modern physics—where classic and quantum physics work side by side—as a standard of scientific pluralism. Such pluralistic openness may seem unscientific or impractical given the mindset of normal medicine, but it would certainly be worthwhile if it yielded even a few new tools, much less a whole new “medical bag” of theories and methods for those stubborn, intractable problems.

Perhaps the most serious challenge posed by alternative medicine is the demand for scientific openness and flexibility in approaching traditional healthcare. To research traditional healthcare on its own terms rather than distorting or dismembering it to fit our conventions, we must be ready to adapt current methods in a way that fits traditional systems. For example, the effectiveness of a Tibetan medical

treatment of people we normally diagnose with rheumatoid arthritis cannot be tested simply by taking a Tibetan herbal remedy and giving it to our “arthritics.” While a cohort of patients may have the same diagnosis in biomedicine, they will often have several different Tibetan medical diagnoses requiring different treatments. More importantly, traditional methods of integrating the diagnosis and treatment of behavioral and mechanistic factors in disease may be essential to the coherence and effectiveness of the system.<sup>82</sup> Any accurate assessment of the effectiveness of Tibetan medicine, or other alternative medical systems, must allow for such possibilities. Initially, this problem may be minimized in a “black box” methodology, which only considers conventional diagnosis and outcome measures and leaves the traditional physician free to prescribe and treat.

Despite such challenges, however, the theoretical and practical potential of a pluralistic approach to scientific medicine is clear in the promise of a truly integrative form of modern medicine. In light of modern physics and common sense, one would expect diverse medical systems to have different strengths and weaknesses in theory and in practice. Western medicine, with its mechanistic models and methods, has the only advanced surgical tradition, while Indo-Tibetan medicine abandoned surgery long ago. However, the behavioral, psychosomatic, and environmental components of disease are poorly understood and treated in the Western tradition—witness the interminable debate over conditions such as chronic fatigue. Traditional systems like Indo-Tibetan medicine tend to have a more integrated view of mind-body-environment functioning and may be reasonably expected to diagnose and treat people with such conditions better. Examples include the prediction that self-involvement is the prime risk factor for fatal heart attacks;<sup>30</sup> the findings that coronary artery disease may be reversed by lifestyle treatments modeled on those prescribed by Ayurveda and Tibetan medicine;<sup>83,84</sup> and the findings that multi-component Tibetan herbs based on the

Buddhist theory of multi-causation may be more effective against claudication, arthritis, and asthma than modern biomedicines.<sup>85</sup>

Finally, when it comes to putting medical pluralism into practice, something like a framework for integrating complementary medical paradigms already exists in current biomedicine. The biopsychosocial model and multidisciplinary team approach developed in psychiatry and later used in adolescent, rehabilitation, and behavioral medicine; family practice; and palliative care, offers a fair approximation to the hybrid of systemic and reductive models and methods in the Indo-Tibetan tradition. Carefully developed, this modern Western model and approach could help ease the application of traditional Asian alternatives to the thorny practical challenges facing complementary and integrative medicine in the 21st century.

### Conflicts of Interest

The authors declare no conflicts of interest.

### References

- Berkenwald, A.D. 1998. In the name of medicine. *Ann. Intern. Med.* **128**: 246–291.
- Pavek, R. & A.L. Trachtenberg. 1995. Current status of alternative health practices in the United States. *Contemp. Intern. Med.* **7**: 61–71.
- Eisenberg, D.R., R.C. Kessler, C. Foster, et al. 1993. Unconventional medicine in the United States: prevalence, costs and patterns of use. *N. Engl. J. Med.* 328:1245.
- Ho, C.M., S.K. Hseu & T.Y. Lee. 1996. Effect of P-6 acupuncture on prevention of nausea and vomiting after epidural morphine for post-Cesarian section pain relief. *Acta Anaesthesiol. Stand.* **40**: 372.
- Al-Sadi, M., B. Newman & S.A. Julious. 1997. Acupuncture in the prevention of postoperative nausea and vomiting. *Anesthesia* **42**: 458–661.
- Huxtable, R.J. 1990. The harmful potential of herbs and other plant products. *Drug Safety* **45**(Supp 1): 126–136.
- Janes, C.R. 1999. The health transition, global modernity and the crisis of traditional medicine: the Tibetan case. *Soc. Sci. Med.* **48**: 1803–1820.

8. Tokar, E. 1999. Seeing to the distant mountain: diagnosis in Tibetan medicine. *Altern. Ther. Health Med.* **5**: 50–58.
9. Begley, S.S. 1994. Tibetan Buddhist medicine: a transcultural nursing experience. *J. Holist. Nurs.* **12**: 323–342.
10. Bagley, C.M. 1998. Letter to the editor. *Ann. Intern. Med.* **128**: 328.
11. Schwabl, H., S. Geistlich & E. McHugh. 2006. Tibetan medicine in Europe: historical, practical and regulatory aspects. *Forsch Komplementarmed.* **13** (Suppl 1): 1–16. Epub 2006 Feb 17.
12. Finckh, E. 1981. Tibetan medicine: theory and practice. *Am. J. Chin. Med.* **9**: 259–267.
13. Rechung Rinpoche. 1973. *Tibetan Medicine*. University of California Press. Berkeley, CA.
14. Badmaev, V. 1998. Tibetan medicine. In *Textbook of Complementary and Alternative Medicine*. W. Jonas & J.S. Levin, Eds. Williams & Wilkins. Baltimore, MD.
15. Dhonden, L.Y. 1974. Tibetan Medicine: a short history. *Tib. Rev.* **May-June**: 13–17.
16. Hattori, M. 1971. *Dignaga on Perception*. Harvard University Press. Cambridge, MA.
17. Dreyfus, G.B.J. 1997. *Recognizing Reality: Dharmakirti's Philosophy and Its Tibetan Interpretations*. SUNY Press. Albany, NY.
18. Thurman, R.A.F. 1984. *Tsong Khapa's Speech of Gold in the Essence of True Eloquence: Reason and Enlightenment in the Central Philosophy of Tibet*. Princeton University Press. Princeton, NJ.
19. La Vallée Poussin, L.D. 1923–1931. *L'Abhidharmakosa de Vasubandhu*, 6 Vols. Institut Beiges des Hautes Etudes Chinoises et Bouddhiques. Paris et Louvain.
20. Dhonden, Y. 1986. *Health Through Balance: An Introduction to Tibetan Medicine*. Snow Lion. Ithaca, NY.
21. Parfionovich, Y., F. Meyer & D. Gyurme. 1592. *Tibetan Medical Painting: Illustrations to the Blue Beryl of Samgye Gyatso*. London.
22. Sharma, R.K. & B. Das. 1995. *Caraka Samhita*, 3 Vols. Chokumba Sanskrit Series. Chokumba Press. Varnasi, India.
23. Lad, V. 1984. *Ayurveda: The Science of Self-Healing*. Wilmot Lotus Press, Twin Lakes, WI.
24. Clifford, T. 1984. *Tibetan Buddhist Medicine and Psychiatry*. Samuel Weiser. New York, NY.
25. Finckh, E. 1984. Tibetan medicine—constitutional types. *Am. J. Chin. Med.* **12**: 44–49.
26. Clark, B. 1995. *The Quintessence Tantras of Tibetan Medicine*. Snow Lion. Ithaca, NY.
27. Boronoev, V.V. & O.S. Rinchinoiv. 1996. Several aspects of software implementation of a computerized pulse diagnostics complex. *Med. Tekh.* **Sep-Oct**: 36–38.
28. Kosoburov, A.A. 1996. Transducer for pulse diagnostics. *Med. Tekh.* **Sep-Oct**: 35–36.
29. Rapgay, L. 1986. A guide to Tibetan medical urinalysis. *Acupunct. Electrother. Res.* **11**: 25–43.
30. Scherwitz, L., L.E. Graham, G. Grandits, *et al.* 1986. Self-involvement and coronary heart disease incidence in the multiple risk factor intervention trial. *Psychosom. Med.* **84**: 187–159.
31. Porter, J.M., B.S. Cutler, B.Y. Le, *et al.* 1982. Pentoxifylline, pharmacologic treatment of intermittent claudication. *Surgery* **92**: 966.
32. Drabaek, M.J., H. Himmelstrup, K. Winther. 1993. A botanical compound Padma 28 increases walking distance in stable intermittent claudication. *Angiology* **44**: 863–867.
33. Smulski, H.S. & J. Wojcidd. 1995. Placebo controlled double blind trial to determine the efficacy of the Tibetan plant preparation Padma 28 for intermittent claudication. *Altern. Ther. Health Med.* **10**: 44–49.
34. Melzer, J., R. Brignoli & R. Saller. 2006. Efficacy and safety of Padma 28 in peripheral arterial occlusive disease. *Forsch Komplementarmed.* **13**(Suppl 1): 23–27. Epub 2006 Feb 17.
35. Bhat, Z.A., S.H. Ansari, H.M. Mukhtar, *et al.* 2005. Effect of *Aralia cachemirica* Decne root extracts on blood glucose level in normal and glucose loaded rats. *Pharmazie* **60**: 712–713.
36. Zhang, Y.J., Y. Hou & Y.B. Cao. 1995. Effect of Tibetan compound prescription on cardiac haemodynamics in experimental myocardial ischemia in dogs. *Zhongguo Zhong Xi Yi Jie He Za Zhi* **15**: 231–233.
37. Semenova, L.Y., Zh.M. Salmasi, A.N. Kazimirskii & G.V. Poryadin. 2004. Taban-Arshan: immunocorrector in atopic bronchial asthma. *Bull. Exp. Biol. Med.* **138**: 65–66.
38. Semenova, L.Y., Zh.M. Salmasi, A.N. Kazimirskii & G.V. Poriadin. 2005. Mechanisms of immunotropic effect of the drug composition Taban-Arshan (Tibet medicine) on lymphocytes of patients with early rheumatoid arthritis and atopic bronchial asthma. *Patol. Fiziol. Eksp. Ter.* **Jan-Mar**: 23–25.
39. Ishizaki, T., A. Sakai, T. Koizumi, *et al.* 2004. Blunted effect of the Kv channel inhibitor on pulmonary circulation in Tibetan sheep: a model for studying hypoxia and pulmonary artery pressure regulation. *Respirology* **9**: 125–129.
40. Liu, J.P., M. Yang, Y.X. Liu, *et al.* 2006. Herbal medicines for treatment of irritable bowel syndrome. *Cochrane Database Syst. Rev.* **25**: CD004116.
41. Moeslinger, T., R. Friedl, I. Volf, *et al.* 2000. Inhibition of inducible nitric oxide synthesis by the herbal preparation Padma 28 in macrophage cell line. *Can. J. Physiol. Pharmacol.* **78**: 861–866.
42. Diniz, R.O., L.K. Garla, J.M. Schneedorf & J.C. Carvalho. 2003. Study of anti-inflammatory activity of Tibetan mushroom, a symbiotic culture of bacteria

- and fungi encapsulated into a polysaccharide matrix. *Pharmacol. Res.* **47**: 49–52.
43. Weseler, A., R. Saller & J. Reichling. 2002. Comparative investigation of the antimicrobial activity of PADMA 28 and selected European herbal drugs. *Forsch Komplementarmed Klass Naturheilkd* **9**: 346–351.
  44. Du, Z., N. Zhu, N. Ze-Ren-Wang-Mu & Y. Shen. 2003. Two new antifungal saponins from the Tibetan herbal medicine *Clematis tangutica*. *Planta Med.* **69**: 547–551.
  45. Wang, J.L., Y. Sun, H.Y. Zhou, et al. 2006. Effects of traditional Tibetan medicine, *Fructus lonicerae* microphyllae on phagocytosis and cytokines production of murine macrophages. *Zhongguo Zhong Yao Zhi* **31**: 145–148.
  46. Sun, Y., Y.H. Li, X.X. Wu, et al. 2006. Ethanol extract from *Artemisia vestita*, a traditional Tibetan medicine, exerts anti-sepsis action through down-regulating the MAPK and NF-kappaB pathways. *Int. J. Mol. Med.* **17**: 957–962.
  47. Barak, V., I. Kalickman, T. Halperin, et al. 2004. PADMA-28, a Tibetan herbal preparation is an inhibitor of inflammatory cytokine production. *Eur. Cytokine Netw.* **15**: 203–209.
  48. Zhu, L., L. Chen & X. Xu. 2003. Application of a molecularly imprinted polymer for the effective recognition of different anti-epidermal growth factor receptor inhibitors. *Anal. Chem.* **75**: 6381–6387.
  49. Gao, J., S.J. Wang, F. Fang, et al. 2004. Xanthones from Tibetan medicine *Halenia elliptica* and their antioxidant activity. *Zhongguo Yi Xue Ke Xue Yuan Xue Bao* **26**: 364–367.
  50. Suter, M. & C. Richter. 2000. Anti- and pro-oxidative properties of PADMA 28, a Tibetan herbal formulation. *Redox Rep.* **5**: 17–22.
  51. Shukla, S.K., P. Chaudhary, I.P. Kumar, et al. 2006. Protection from radiation-induced mitochondrial and genomic DNA damage by an extract of *Hippophae rhamnoides*. *Environ. Mol. Mutagen.* **47**(9): 647–656.
  52. Hofbauer, S., V. Kainz, L. Golser, et al. 2006. Antiproliferative properties of Padma Lax and its components ginger and elecampane. *Forsch Komplementarmed.* **13**(Suppl 1): 18–22. Epub 2006 Feb 17.
  53. Cohen, L., C. Warneke, R.T. Fouladi, et al. 2004. Psychological adjustment and sleep quality in a randomized trial of the effects of a Tibetan yoga intervention in patients with lymphoma. *Cancer* **100**: 2253–2260.
  54. Hai, P., S. Zhou, H. Shang & G. Zhao. 1997. Antianoxic effects of *Dracocephalum tanguticum* on brain of mice. *Zhong Yao Cai.* **20**: 198–200.
  55. Newberg, A., A. Alavi, M. Baime, et al. 2001. The measurement of regional cerebral blood flow during the complex cognitive task of meditation: a preliminary SPECT study. *Psychiatry Res.* **106**: 113–122.
  56. Fasko, D., Jr., M.R. Osborne, G. Hall, et al. 1992. Comeditation: an exploratory study of pulse and respiration rates and anxiety. *Percept. Mot. Skills* **74**(3 Pt 1): 895–904.
  57. Zhang, H.W., C.Y. Wang, H.N. Xu, et al. 2006. Clinical study on effect of fluoxetine combined with Chinese medicine or Tibetan drugs in treating senile depression in plateau district. *Zhongguo Zhong Xi Yi Jie He Zhi* **26**: 202–204.
  58. Ryan M. 1997. Efficacy of the Tibetan treatment for arthritis. *Soc. Sci. Med.* **44**: 535–539.
  59. Zhao, S.L., P.L. Geng & J. Sang. 1993. Immune function of rheumatoid arthritis treated by medicated-bath therapy in Tibetan medicine. *Zhongguo Zhong Xi Yi Jie He Zhi* **13**: 467–470, 452–453.
  60. Zou, A.P., N. Parekh, M. Steinhausen. 1991. Dopaminergic effect of anisodamine on the microcirculation of the hydronephrotic kidney of rats. *J. Tongji Med. Univ.* **11**: 65–72.
  61. Nikolaev, S.M., Z.G. Sambueva, G.V. Chekhirova & A.V. Tsyrenzhavov. 2003. Effect of hepatophyt on the choleric function of the liver damaged by tetracycline. *Antibiot Khimioter* **48**: 24–26.
  62. Razumov, A.N. & G.T. Namsaraeva. 2005. Perspectives of integration of Tibet medicine physical methods into the system of current rehabilitative medicine. *Vopr Kurortol Fizioter Lech Fiz Kult.* **Mar-Apr**: 4–7.
  63. Feldhaus, S. 2006. Treatment of a tetraplegic patient with chronic constipation with the Tibetan remedy Padma Lax—a case report. *Forsch Komplementarmed.* **13**(Suppl 1): 31–32. Epub 2006 Feb 17.
  64. Wang, J., Y. Sun, Y. Li & Q. Xu. 2005. Aqueous extract from aerial parts of *Artemisia vestita*, a traditional Tibetan medicine, reduces contact sensitivity in mice by down-regulating the activation, adhesion and metalloproteinase production of T lymphocytes. *Int. Immunopharmacol.* **5**: 407–415.
  65. Aslam, M.N., H. Fligel, H. Lateef, et al. 2005. PADMA 28: a multi-component herbal preparation with retinoid-like dermal activity but without epidermal effects. *J. Invest. Dermatol.* **124**: 524–529.
  66. Goss, R.E. & D. Klass. 1997. Tibetan Buddhism and the resolution of grief: the Bardo-thodol for the dying and the grieving. *Death Stud.* **21**: 377–395.
  67. Chalmers, A.F. 1982. *What Is This Thing Called Science?* Queensland University Press. St. Lucia.
  68. Lakotos, I. 1978. *The Methodology of Scientific Research Programs*, Vol. 1. Cambridge University Press. Cambridge.
  69. Popper, K. 1965. *The Logic of Scientific Discovery*. Harper & Row. New York, NY.
  70. Popper, K. 1979. *Objective Knowledge: An Evolutionary Approach*. Clarendon Press. Oxford.

71. Temkin, O. 1977. *The Double Face of Janus and Other Essays in the History of Medicine*. Johns Hopkins University Press. Baltimore, MD.
72. Kitcher, P. 2003. *Science, Truth and Democracy*. Oxford University Press. Oxford.
73. Engle, G. 1977. The need for a new medical model: A challenge for biomedicine. *Science* **196**: 29–136.
74. Bohm, D. 1980. *Wholeness and the Implicate Order*. Ark Press. London.
75. Varela, F., E. Thompson & E. Rosch. 1996. *The Embodied Mind: Cognitive Science and Human Experience*. MIT Press. Cambridge, MA.
76. Capra, F. 1982. *The Turning Point Science, Society and the Rising Culture*. Bantam. New York, NY.
77. Kuhn, T. 1962. *The Structure of Scientific Revolutions*. University of Chicago Press. Chicago, IL.
78. Kitcher, P. 1993. *The Advancement of Science: Science Without Legend, Objectivity Without Illusions*. Oxford University Press. Oxford.
79. Kuhn, T. 1977. *The Essential Tension: Selected Studies in Scientific Tradition and Change*. Chicago University Press, IL. Chicago, IL.
80. Sarton, G. 1927. *Introduction to the History of Science*. Williams & Wilkins. Baltimore, MD.
81. Needham, J. 1964. *Science and Civilization in Ancient China*. Oxford University Press. Oxford.
82. Adams, V., S. Miller, S. Craig, *et al.* 2005. The challenge of cross-cultural clinical trials research: case report from the Tibetan Autonomous Region, People's Republic of China. *Med. Anthropol. Q.* **19**: 267–289.
83. Ornish, D., L.W. Scherwitz, R.S. Doody, *et al.* 1983. Effects of stress management training and dietary changes in treating ischemic heart disease. *JAMA* **247**: 54–59.
84. Ornish, D., S. Brown, L. Scherwitz, *et al.* 1990. Can lifestyle changes reverse coronary heart disease? *Lancet* **336**: 129–133.
85. Ueberall, F., D. Fuchs & C. Vennos. 2006. Anti-inflammatory potential of Padma 28—review of experimental data on the antiatherogenic activity and discussion of the multi-component principle. *Forsch Komplementarmed.* **13**(Suppl 1):7–12. Epub 2006 Feb 17.