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PERSPECTIVE

Traditional Alternatives as Complementary Sciences: The Case of Indo-Tibetan Medicine

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ABSTRACT

Traditional medical systems, like those preserved in Asia, pose a challenge because they involve theories and practices that strike many conventionally trained physicians and researchers as incomprehensible, even nonsensical. Should modern medicine continue to dismiss these systems as unscientific, therefore worthy of debunking rather than serious study; view them as sources of alternatives, possibly effective but hidden in a matrix of prescientific custom and belief; or do they represent something like a complementary science of medicine? We make the latter argument using the example of Indo-Tibetan medicine. Indo-Tibetan medicine is based on analytic models and methods that are rationally defined, internally coherent, and make testable predictions, therefore meeting current definitions of "science." The possibility of multiple, complementary sciences is a consequence of certain findings in physics that have led to a view of science as a set of tools—instruments of social activity that depend on learned agreement in aims and methods—rather than as a monolith of absolute objective truth. Implications of this pluralistic view of science for medical research and practice are discussed.

INTRODUCTION

The term "alternative medicine" has come to mean any healthcare remedy or system not generally accepted in modern biomedicine (Berkenwald, 1998), from Swedish massage to homeopathy; from macrobiotics to the traditional Asian systems of medicine (Pavek and Trachtenberg, 1995). Although many patients use forms of alternative medicine (Eisenberg et al., 1993), either alone or with conventional biomedicine, physicians and researchers have tended to be critical 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, 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. In fact, recent studies already have shown some remedies effective—such as ac-

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upuncture for nausea (Ho et al., 1996; Al-Sadi et al., 1997)—while flagging others as potentially dangerous (Huxtable, 1990). The Office of Alternative Medicine at the National Institute of Health (NIH) 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. Unlike modern alternatives to biomedicine from the West, these Asian traditions are more comprehensive in nature and scope, with relatively complete systems of theory, practice, education, and training that have enabled them to withstand the centuries. 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 (Bagley, 1998).

The growing popularity of Asian healthcare traditions in the United States 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 fools' gold of prescientific practices and beliefs? Finally, is it possible that Asian healthcare traditions, properly approached, may have something to contribute as coherent systems to modern medicine; that, behind their patently prescientific language and arts lie something like another scientific model and empirical method of 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 alternatives.

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 everyday alongside classic 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 examples of such paradigms.

THE CASE OF 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.) as a synthesis of Indian, Chinese, Central Asian, and Greco-Persian medicine (Rechung, 1973). 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 (Badmaev, 1998). Consequently, Tibetan medicine is the most comprehensive system of classical Eurasian medicine, integrating methods ranging from acupuncture and herbal pharmacology to yoga and meditation (Dhonden, 1974). Finally, because Tibet remained isolated until the Chinese invaded in 1959, it is the best preserved example of these medical traditions.

Following the Indian empirical tradition, Tibetan medicine rejected the authority of tradition, revelation, and scripture, while accepting the ultimate validity only of inference (skt. *anumana* = tib. [transliterated phonetically] *jepak*) and evidence (*pratyaksa* = *ngonsum*) (Hattori, 1971; Dreyfus, 1997). 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 en-

ergy (*vayu* = *lung*) and evolutionary causality (*karmaphala* = *laydray*) had been ruled out (Thurman, 1984). By the first century C.E., the possibility of an indivisible atom or ultimate particle (*paramanu* = *dultrarab*) had been ruled out; all particles were known also to have wave-like, space-like, and energetic properties supporting changes between five elementary states (*mahabhuta* = *jungpochay*) of matter—solid, liquid, gas, energy and space or information (*rupa, ambu, vayu, agni, akasha/vijnapti* = *sa, chu, me, lung, namka/namrig*) (La Vallee Poussin, 1931); and the universal relativity (*pratityasamutpada* = *tenjung*) of all science and method had been conclusively established (Thurman, 1984). 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 (*yuktijnana* = *rigpay-yeshay*).

Synthesizing Ayuvedic Indian and Chinese traditions, Tibetan physiology analyzes the body into 4 levels, defining 3 aspects of systemic self-organization (*dosha* = *nay*); 11 organ systems (ch. *liu-fuwu-zang* = tib. *don-nod*); 7 tissue elements (skt. *dhatu* = tib. *zung*), and 5 biomolecular elements (*adhyatmabhuta* = *nangjungpo*) linked to the 5 states of inorganic matter mentioned above (Dhonden, 1986; Parfionivich, 1992). 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 *tridosha* model is routinely misunderstood (Sharma and Das, 1995; Lad, 1984).

Given the Indo-Tibetan definition of health as the homeostasis (*svastha* = *rangnas*) of inner and outer systems and elements, physiology is defined by order (*prakrti* = *rangzhin*) and pathology by disorder (*vikrti* = *namjay*). Systemic order and disorder are characterized in terms of 3 aspects of psychophysical self-organization (*ahamkara* = *ngardzin*). Although the mind and body have 1 actuality (*ekabhava* = *ngochig*), by convention, they are referred to in various contexts using correlated physiological and psychological terms (Clifford, 1984). In reference to physiology, the 3 aspects of self-organization may best be conceived as systemic aspects of activity, vitality, and stability, although they are typically misunderstood as reducible to the substances that exemplify and symbolize them, "wind," "bile," and "phlegm" (*vata, pitta, kapha* = *lung, treepa, bayken*). In theory and practice, the language of 3 psychosomatic aspects serves as a typology for the qualitative description of systemic processes, functions, and structures. The aspect of activity, for instance, refers to the central regulatory function of the nervous system, analyzed into 10 forms of activity, the 5 most basic of which are vital-conscious, respiratory-expressive, digestive-metabolic, excretory-reproductive, and motor-proprioceptive. Similarly, the aspect of vitality refers to the functions of the digestive system and metabolism, while stability 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 is linked with the heart, with muscle and connective tissue, and with compounds stable in liquid and solid states.

The analysis of systemic self-organization in the Indo-Tibetan tradition permits a simple linkage of physiology to psychology that makes this medical model well suited to psychosomatic and behavioral medicine. Although consciousness is specifically linked with the aspect of activity, especially vital activity (*prana* = *sokdzin*) in the central nervous system (*madhyama-nadi-cakra* = *umai-tsakhor*), the systems of sensation, motivation, perception, and consciousness that make up the process of mind interact with all three aspects of somatic self-organization. In particular, the somatic aspects of activity, vitality, and stability are linked to psychological aspects of attachment, aggression, and self-involvement (*raga, dvesa, moha* = *dochak, khongdro, timuk*), as well as obsessive, compulsive, and addictive types of disease-prone personality (Dhonden, 1986).

Given this systemic psychophysiology, Ti-

betan pathology looks beyond the immediate precipitants and mechanisms of disease to the behavioral and psychosomatic factors that impair self-organization and make people disease-prone. Thus, pathogens such as parasites (*kirmi = sinbu*), microorganisms (*kirmika = sinbunyi*), and trauma are considered not as primary etiologies but as risk factors similar to unhealthy diet, lifestyle, and environment. The primary causes of disease are the obsessive, compulsive, and addictive behavior patterns that make people disease-prone, along with the cognitive-perceptual habits and emotional states of attachment, aggression, and self-involvement reinforcing them (Dhonden, 1986; Clark, 1995). 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 of hyperactivity 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 hypervitality 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 such as obesity, diabetes, and atherosclerosis.

Diagnosis in Tibetan medicine is reached by four methods (Clark, 1995). The patient is interviewed to clarify symptoms, behavior, and lifestyle. 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. Finally, urine is analyzed for taste, smell, color, bubbles, steam, and sediment. The data are weighed together to establish the diagnosis and infer pathogenesis.

Given the Tibetan model of health and disease as a biopsychosocial balance, treatment in this sytem ideally consists of multiple noninvasive interventions, fostering self-care through behavior and lifestyle change (Clifford, 1984). A typical treatment integrates medical management of the disease with health education directed at the underlying behavioral and psychosomatic disorder. Medical management is prescribed in a hierarchy from least to most invasive, starting with dietary, behavioral, and environmental changes, usually including herbal pharmacotherapy and often massage, moxabustion, and acupuncture. Behavioral treatment usually includes counseling and psychoeducation 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 (Lad, 1984). For example, the nutritional analysis of foods in terms of the 5 states (here rendered literally as earth, water, fire, air, and space) is linked both to the systemic disorder being treated and to a system 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 multicomponent compounds designed to simultaneously treat disorders, restore balance, and control side effects (Badmaev, 1998). A more complex analytic scheme of 20 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. 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. 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.

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 (Scherwitz et al., 1986) that a mindset of self-involvement is the single most significant risk factor for mortality due to myocardial infarction in coronary artery disease 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 trails (Porter et al., 1982; Drabaek et al., 1993; Smulski et al., 1995) that a multicomponent Tibetan herbal formula called Padma 28 is nearly twice as effective in peripherovascular disease as pentoxyfylline and neftidrofuryl yet associated with minimal to no significant side effects is what Indo-Tibetan medicine would predict (Badmaev, 1998), although it clearly challenges the current biomedical paradigm.

Even though its models, methods, and predictions are systemic and qualitative rather than reductive and quantitative, could this system of healthcare and its paradigm of theory and practice nonetheless be called "scientific" in the modern sense? Clearly, its models, methods, and predictions differ so dramatically from those of conventional biomedicine that the traditional Indo-Tibetan and modern Western paradigms may be called "incommensurate," in Kuhn's (1962) terms. It would be a mistake to think of Tibetan models as prescientific versions of their modern Western scientific counterparts, because they support predictions and methods unthinkable and not worth trying from a biomedical point of view.

Most physicians and scientists believe that any healthcare system that is not scientific in the current conventional sense must be nonsense. Those who argue that conventional medicine is the only possible form of scientific medicine base their dismissal of unconventional medicine on the claim that only modern biomedicine is objective and empirically verifiable. This claim in turn is based on the premise that there is only one objective picture of reality and only one valid empirical method of verifying it. This premise involves a line of reasoning called inductivism, according to which science works by gathering theory-free data and deriving theories from them using only inductive logic and statistical analysis (Chalmers, 1982). In this view, alternate pictures of reality such as the systemic, qualitative descriptions of Tibetan medicine must be objectively and empirically false once those of modern biomedicine have been proven objectively and empirically true.

By the mid-1970s, this objectivist-empiricist view of science and inductivist view of scientific method 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 (Chalmers, 1982). 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 (Lakotos, 1978). 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 (Popper, 1965). 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 (Popper, 1979). 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 (Temkin, 1977). 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 (Engel, 1977), as have some of our colleagues in the basic sciences such as physics and neuroscience (Bohm, 1980; Varela et al., 1996). 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 (Capra, 1982). 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. The 19th century view of science as limited to one monolithic paradigm has given way in this 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 it and still routinely used where more 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 naïve 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, "noninvasive" or "self-care" paradigms; and the current biomedical model best suited to manipulative medical-surgical intervention an "invasive" or "other-care" paradigm.

CONCLUSIONS

In this article we have made three points about traditional Asian 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 forms of alternative medicine because they are comprehensive systems based on coherent 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.

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, ie, the only possible form of scientific medicine. As proponents of evidence-based medicine today point out, much of what we clinicians say and do every day is based on education, training, and shared experience (ie, 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 Kuhn calls "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 calls "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 (Kuhn, 1977). 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 attitutde of extraordinary open-mindedness is what is called for at least some of the time in trying to understand and study traditional medicine (Sarton, 1927; Needham, 1964). 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 behaviroal and mechanistic factors in disease may be essential to the coherence and effectiveness of the system. 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 theo-

retical and practical potential of a pluralistic approach to scientific medicine is clear in the promise of a genuine complementary 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 early on. However, the behavioral and psychosomatic 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 these conditions better. Examples include the prediction that self-involvement is the prime risk factor for fatal heart attacks (Scherwitz, 1986) and the findings that coronary artery disease may be reversed by lifestyle treatments modeled on Ayurveda (Ornish et al., 1983, 1990). 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 medicine in the 21st century.

REFERENCES

Al-Sadi M, Newman B, Julious SA. Acupuncture in the prevention of postoperative nausea and vomiting. Anesthesia. 1997;52:658–661.

Badmaev V. Tibetan medicine. In: Jonas W, Levin JS, eds. Textbook of Complementary and Alternative Medicine. Baltimore: Williams & Wilkins, 1998, in press.

Bagley CM. Letter to the editor. Ann Intern Med. 1998;128:328.

Berkenwald AD. In the name of medicine. Ann Intern Med. 1998;128:246–250.

Bohm D. Wholeness and the Implicate Order. London: Ark Press, 1980.

Capra F. The Turning Point: Science, Society and the Rising Culture. New York: Bantam, 1982.

Chalmers AF. What Is This Thing Called Science? St. Lucia: Queensland University Press, 1982.

Clark B. The Quintessence Tantras of Tibetan Medicine. Ithaca: Snow Lion, 1995.

Clifford T. Tibetan Buddhist Medicine and Psychiatry. New York: Samuel Weiser, 1984.

Dhonden LY. Tibetan Medicine: A short history. Tib Rev 1974; May-June:13–17.

Dhonden Y. Health Through Balance: An Introduction to Tibetan Medicine. Ithaca: Snow Lion, 1986.

Drabaek H, Mehlseb J, Himmelstrup H, Winther K. A botanical compound Padmas 28 increases walking distance in stable intermittent claudication. Angiology 1993;44:863–867.

Drefus GBJ. Recognizing Reality: Dharmakirti's Philosophy and its Tibetan Interpretations. New York: SUNY Press, 1997.

Eisenberg DR, Kessler RC, Foster C, Norlock FE, Calkins DR, Delbanco TL. Unconventional medicine in the United States: Prevalence, costs and patterns of use. N Engl J Med 1993;328:245.

Engle G. The need for a new medical model: A challenge for biomedicine. Science 1977;196:129–136.

Hattori M. Dignaga on Perception. Cambridge: Harvard University Press, 1971.

Ho Cm, Hseu SK, Lee TY. Effect of P-6 acupressure on prevention of nausea and vomiting after epidural morphine for post-Ceasarian section pain relief. Acta Anesthesiol Scand 1996;40:372–375.

Huxtable RJ. The harmful potential of herbs and other plant products. Drug Safety 1990;5(Suppl 1):126–136.

Kuhn T. The Structure of Scientific Revolutions. Chicago: University of Chicago Press, 1962.

Kuhn T. The Essential Tension: Selected Studies in Scientific Tradition and Change. Chicago: Chicago University Press, 1977.

La Vallee Poussin LD. L'Abhidharmakosa de Vasubandhu. 6 Vols. Paris et Louvain: Institut Belges des Hautes Etudes Chinois et Bouddhiques, 1923–1931.

Lad V. Ayurveda: The Science of Self-Healing. Wilmot: Lotus Press, 1984.

Lakotos I. The Methodology of Scientific Research Programs. Vol 1. Cambridge: Cambridge University Press, 1978.

Needham J. Science and Civilization in Ancient China. Oxford: Oxford University Press, 1964.

Ornish D, Scherwitz LW, Doody RS, Kesten D, McLanahan SM, Brown SE, DePuey E, Sonnemaker R, Haynes C, Lester J, McAllister GK, Hall RJ, Burdine JA, Gotto AM Jr. Effects of stress management training and dietary changes in treating ischemic heart disease. JAMA 1983;247:54–59.

Ornish D, Brown S, Scherwitz L, Billings J, Armstrong

WT, Ports TA, McLanahan SM, Kirkeeide RL, Brand R, Gould KL. Can lifestyle changes reverse coronary heart disease? Lancet 1990;336(8708):129–133.

Parfionivich Y, Meyer F, Gyurme D. Tibetan Medical Paintings: Illustrations to the Blue Beryl of Samgye Gyatso. London: Serinda, 1992.

Pavek R, Trachtenberg AI. Current status of alternative health practices in the United States. Contemp Intern Med 1995;7(8):61–71.

Popper K. The Logic of Scientific Discovery. New York: Harper & Row, 1965.

Popper K. Objective Knowledge: An Evolutionary Approach. Oxford: Clarendon Press, 1979.

Porter JM, Cutler BS, Le BY, Reich T, Reichele FA, Scogin JT, Standness DE. Pentoxifylline, pharmacologic treatment of intermitten claudication. Surgery 1982;92:966.

Rechung Rinpoche. Tibetan Medicine. Berkeley: University of California Press, 1973.

Sarton G. Introduction to the History of Science. Williams & Wilkins: Baltimore, 1927.

Scherwitz L, Graham LE, Grandits G, Beuhler J, Billings J. Self-involvement and coronary heart disease incidence in the multiple risk factor intervention trial. Psychosom Med 1986;84(3/4):187–199.

Sharma RK, Das B. Caraka Samhita. 3 Vols. Varnasi: Chokumba Sanskrit Series, 1995.

Smulski HS, Wojcicki J. Placebo controlled double blind trial to determine the efficacy of the Tibetan plant preparation Padma 28 for intemittent claudication. Altern Ther Health Med 1995;1(3):44–49.

Temkin O. The Double Face of Janus and Other Essays in the History of Medicine. Baltimore: Johns Hopkins University Press, 1977.

Thurman RAF. Tsong Khapa's Speech of Gold in the Essence of True Eloquence: Reason and Enlightenment in the Central Philosophy of Tibet. Princeton: Princeton University Press, 1984.

Varela F, Thompson E, Rosch E. The Embodied Mind: Cognitive Science and Human Experience. Cambridge: MIT Press, 1996.

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