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Imbibing the Text, Transforming the Body, Perceiving the Patient:
Cultivating Embodied Knowledge for Tibetan Medical Diagnosis

By
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Doctor of Philosophy

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T.M.D. (Kachupa-equivalent), Tibetan Medical College, Qinghai University, 2015
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An abstract of
A dissertation submitted to the Faculty of the
James T. Laney School of Graduate Studies of Emory University
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Abstract

Imbibing the Text, Transforming the Body, Perceiving the Patient:
Cultivating Embodied Knowledge for Tibetan Medical Diagnosis
By Tawni Lynn Tidwell

Tibetan medical diagnostics provide a powerful lens for understanding embodied expertise among Tibetan physicians. This investigation probes the transmission and practice of Tibetan medical diagnosis as a gateway to understanding the epistemic grounds for Tibetan conceptions of illness and healing. Participatory research as a student at two major sites for Tibetan medical training, Men-Tsee-Khang in north India and at Sorig Loling in Amdo, focused on the role of embodied knowledge in diagnosis along two analytic dimensions, namely physician as embodied diagnostic instrument, and patient as embodying disease processes. Training of physicians as diagnostic instrument is elucidated using biocultural methods, Mauss's notion of habitus, and understandings of enacted cognition, memory, metaphor, and visualization from cognitive neuroscience. Disease processes embodied in the patient are tracked through a bioecocultural model of development and logics of biomarkers. Grounded theory from seventh century Buddhist logician Dharmakīrti's approach to valid cognition—*pramāṇa* theory–acts as interlocutor with Western scholarship on these dimensions.

This work challenges common assumptions about "rote memorization" and pedagogical values in Western education. It suggests that memorization, recitation, metaphor, and learning through praxis generate a conceptual-perceptual dialectic that drives processes cultivating embodied knowledge transmission. For the Tibetan physician, "methods of becoming" are "methods of diagnosis" by developing the senses, training the mind, and sculpting the physician's skilled body as vessel and instrument for diagnosis and healing. Rigorous practice and associated self cultivation form the grounds for acquisition of expertise. This project documents a distinctive approach to medical education that simultaneously fosters rigorous medical knowledge and humanistic skills with distinctive diagnostic and therapeutic value.

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Notes on Translation and Technical Terms

In the contents of this manuscript, I have chosen to translate most terms into English for accessibility to readers from a wide range of disciplines while retaining the Tibetan in footnotes for reference. I use the simplified phonetic transcription of standard Tibetan as formalized by David Germano and Nicolas Tournadre (2010) which generally follows pronunciation customs according to the Lhasa region—with which most readers will likely be more familiar—despite the distinct difference in pronunciation between Lhasa and Amdo, the latter with which I spent the later half of my medical education. I include the Tibetan original terms on first use in the footnotes. On occasion, when providing Sanskrit terms, I include the Tibetan in the transliteration system in-text as devised by Turrell Wylie (see Wylie, Turrell. 1959. "A Standard System of Tibetan Transcription," *Harvard Journal of Asiatic Studies* 22:261-7).

There are also a couple specific terms in which I retain the Wylie transliteration in the main text as well (e.g., *rlung*, pronounced "loong" for the "winds" component of the three functional energetic systems, *nyépa*) to retain their conceptual complexity, while introducing the proper pronunciation as done so here. This is to familiarize the reader with these technical terms and facilitate their greater circulation among the literature due to their critical role in understanding key concepts in Tibetan medicine, similar to the Sanskrit term *karma* which has entered the English vernacular. Likewise, the analysis of these terms in the context of the present work and their inability to be collapsed into English, Sanskrit, Chinese or Greek translations, of which many previous authors (Garrett 2006) have used, illustrates their

distinct meaning and practical use separate from those other corollaries used in past works. Thus, *rlung*, *tripa*, *béken* are not wind, bile, and phlegm, nor are they *vata*, *pitta* or *kapha*; *qi*, *yang* or *yin*; wind, fire or water-earth (see Obermiller 1989 [1935]; Tokar 2008; Gerke 2011, 2012 for similar argument). The terms themselves are particular and carry valences and historical continuities that these other translations do not. Likewise, *vata*, *qi*, and wind, though similar, are quite distinct because of the historical, cultural, geographical, ecology and social context in which they developed and thus, diverged from each other if they had any semblance at an earlier period in history.

I will also use a shorthand for sections of the *Four Medical Transmission* (*Gyüzhi*, pronounced gyü shee"), which comprises four transmissions, "tantras," treatises, or books that can be understood separately (rarely) or as a cohesive collection (almost universally). The term "*gyü*" (*rgyud*[1]) can be understood as tantra, transmission or continuum. Although the standard translation chosen is tantra since it is how it is understood in commentary, I choose to translate *gyü* as "transmission" to retain the wider meaning of "*tantra*" and how each section of the text is understood as an oral transmission from the mind emanation of the Medicine Buddha. This also retains the understanding that each "transmission" is given for different purpose and insight into the medical system, though they are studies as one cohesive unit.

The first section is known as the *Root Transmission*, the second section is known as the *Explanatory Transmission*, the third section is known as the *Oral Instructions Transmission* and the fourth section is known as the *Subsequent Transmission*. I will use the

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[1] རྒྱུད།

convention TII Ch 2:23-25, to be read as *Four Medical Transmissions*, second text (*Explanatory Transmission*), Chapter 2, pages 23-25 from the Dharamsala 2008 edition of the full *Four Medical Transmissions* for the *Oral Instruction Transmission* references, and the Dharamsala 1999 edition of the *Three Medical Transmission* version for the other references. It is said that the *Root Transmission* is sufficient for those of greatest intellect; whereas those of middling intellect need the addition of the *Explanatory Transmission* and there on until those of least capacity need all four transmissions. In practice, all students completing a formal Tibetan medical degree in Tibet or outside Tibet study all four transmissions. There are some technical schools in Tibet which only teach the first, second and fourth transmissions. These students are seen more as health technicians than medical doctors.

Unless otherwise noted, all Tibetan translations of written or spoken reference are done by the author.

Tawni Tidwell
Atlanta, GA
Autumn, 2017

Introduction

Various civilizations have used technology, broadly understood, to advance sensory understandings as a means of gaining greater knowledge about ourselves and the universe. The use of technology has been particularly important in alleviating illness and suffering and enhancing health and longevity. Some familiar diagnostic technologies of contemporary biomedicine include the microscope, sonogram, echocardiogram, and fMRI. All of these technologies are useful and can be beneficial in the practice of medicine; that which can be known in biomedicine is assumed to gain better resolution and accuracy through the use of advanced technology. We "see" better through technological mediation. However, by relying on the mediation of such technologies to shape what we know about bodies, health, and disease, we have neglected the information that may be gained vis-à-vis the senses and the training required to develop them for high performance use, such as detecting minute chemical details in odors or deciphering visual cues of individuals from a specific species.

One can argue that human evolution itself has provided us with many tools that are more nuanced and precise than any technology we have developed to date — that is, our five sensory organs themselves and the brain-body complex that processes this sensory data. This does not mean that perceptions made by the sensory organs are not subject to error. However, the capacity to train oneself to make highly precise apprehensions using the senses is well known. Fighter pilots use their acute sight to maneuver through tight aerial obstacles, violinists decipher minute pitch differences through well-trained ears, and wine tasters distinguish fine variations in chemical patterns

among wines through a cultivated tongue. Such expertise requires embodied knowledge developed with great rigor.

Our bodies have the basis for developing such subtle differentiation—and have developed basic structures over evolutionary history to do so. For example, the human sense of smell can detect subtle sub-particle differentiations like the chirality of a molecule — simple "handedness" of the same exact molecular structure or of two molecules that are mirror images. By detecting the different handedness of molecules, our sense of smell produces the distinct perceptual difference of the smell of spearmint rather than of caraway seeds[1] (Bentley 2006). From our earliest moments of fetal and early childhood development as human beings, we need sensory input for basic development, tuning the sensory organs and their related neural processing.

What we know through our senses is not necessarily immediately accessible by the regions of our brain that synthesize such information into coherent thoughts, analyses, and descriptions. *How* we know what we know and how that knowing translates into molecular and sub-molecular interactions through our body is still poorly understood. This realization provides a window into the still wide chasm between current research in particle physics, broad biology, human physiology, and the inner workings of our own body in relation to the processing of our environment and experiences.

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[1] This well-known example of enantiomers, or mirror image forms of molecules, is the molecular structure of the primary aromatic compound called carvone in spearmint (*Mentha spicata*) and caraway (*Carum carvi*). The two versions of carvone in these plants are simply mirror images of one another, just like the right and left hand can look like mirror images of one another, which is why such differences are sometimes referred to as the "handedness" of the molecule. Since the odor receptors in the nose that interact with aromatic compounds also have a specific structure that responds to the "handedness" of the molecule, the olfactory sense perceives these two nearly identical compounds as distinctly different odors.

Coming from a north American society with an intellectual history that has largely rejected perceptual means of diagnosis as subjective and vulnerable to error, I became interested in how Tibetan medicine prioritizes the physician's embodied knowledge not only as the most common, but rather the preferred means of diagnosis. I chose to explore these questions about sensory perception, ways of knowing, and diagnostic capacities through an immersion into Tibetan medicine, including the sociocultural, linguistic, and philosophical bases for this medical tradition. My dissertation research is part of a larger professional trajectory in becoming the first Westerner fully trained as a Tibetan doctor certified by a Tibetan medical institution and its faculty alongside Tibetan peers in the Tibetan language.

What led me to pursue Tibetan medicine was an initial interest in the body in extreme conditions—high altitude, weightlessness, temperature extremes, poverty and deprivation. Growing up in Colorado and spending much of my young adult life climbing and mountaineering, I was used to seeing and experiencing physiological changes people encounter at high altitude. When I began my Bachelor's degree at Stanford, I focused on studying physics, with a particular interest in biophysics and a pre-medical track. I hoped to pursue an eventual combined study of Western and traditional Chinese medicine—two medical systems that seemed to have distinct insights into the body. I saw biophysics as a basis to understanding synergies between the two systems. At the time, I had no idea how far insights from biophysics research were from being integrated into clinical practice.

My curiosity about these issues started much earlier in my life. I spent the first years of my life in South Korea. Even as a child, I appreciated the approaches of local

medical systems to which I was exposed. They seemed more holistic and person-centered. My father is an orthopedic surgeon. Through conversations with him and my own observations, I began to see distinct differences in approaches between medical traditions. Western medicine seemed very good at the surgical repair of broken parts in the body, acute pain amelioration, and eliminating infection; but I was skeptical about its approaches to subtle health conditions, chronic illness, and maintaining health—as well as what it means to flourish in our bodies and minds. I felt that combining these two traditions—one based in Western science and one rooted in a different way of knowing—would forge new insights about our human selves. I was particularly drawn to the field of aerospace medicine, which observes the body in novel environments, giving the field the capacity to produce new medical insights.

When I was a freshman at Stanford, I heard about Tibetan medicine during a study abroad presentation. I was intrigued. Tibet, with a unique population and permanent settlements at the highest altitudes in the world, has cultural practices geared toward training the body and mind with highly developed methods that affect metabolism, thermoregulation, cardiovascular function and cognition. I was convinced that a medical system from this culture would have compelling explanatory systems for such unique capacities and their resultant physiologies in extreme conditions. As I began reading the literature written in English on this medical system, I was drawn in by its comprehensive approach to health and healing, its extensive *materia medica* and therapies, the integrity of its cultural preservation even in the face of massive social and political change, and its diagnostic methods based on perceptual means of pulse, urine, and assessing the physique

and habitus of the body and mind. I wondered: What were the limits of what could be known by such a system? How successful could its treatments be for the scope of illnesses humanity encounters? What does it lose by not having access to advanced diagnostic technologies *outside* of those developed through sensory perceptions? What does it gain by having had to rely exclusively on perceptual means of analysis?

This initial interest in Tibet and Tibetan medicine led me to study abroad programs in Tibet and north India, including Lhasa, Dharamsala and Ladakh, as intermissions during my physics studies at Stanford. I worked persistently at my language skills. It was clear from my first encounter with Tibetan medicine in the field that I was naive to think I could understand much without fully studying within the system. The necessary linguistic skills alone to train in the system required decades of study, training, and practice; and entry into the system required a fluency of the language for memorizing and reciting texts, and understanding the nuances of its core texts' poetic prose and stanzas. At the time, the goal of attaining the required linguistic mastery to pursue rigorous study of medicine seemed deeply challenging, but I did not abandon hope. I kept up my language studies doggedly, loving the aesthetics of the language — the lens it provided as a unique way of viewing the world. My studies in French and, briefly, Chinese, supported my commitment to learning Tibetan — and seeing through these new cultural eyes.

After graduating from Stanford, I made many trips back and forth to the various regions of Tibet and Tibetan communities in north India and Nepal. I continued improving my language skills, studying grammar and literary form. In conjunction with

entering graduate school at Emory, I found myself in the position to actually consider sitting for the entrance exam to Dharamsala Men-Tsee-Khang[2], the Tibetan medical school in north India, and proposed a course of graduate study to Emory that would allow me to concurrently pursue Tibetan medical school along with my doctoral research. This dual degree model exists for a Western MD-PhD, but had yet not been pursued as a Tibetan MD-PhD. Furthermore, no Westerner had passed the Tibetan medical entrance exam at Men-Tsee-Khang to date; only two non-Tibetan foreigners—a Japanese and a Korean—had passed the exam.

The preparation for the five-day entrance exam took a year of concentrated training beyond the previous ten years of Tibetan language study I had accumulated to that point. It required memorizing short root texts, learning the complex grammatical subtleties of formalized classical Tibetan, as well as improving my knowledge of Tibetan society, since general cultural knowledge was tested. I also had to gain proficiency with basics of Buddhist logic, and formalized English translations for classic technical terms in Buddhism, which would also be tested.

I sat for, and passed, the exam in 2011. This was thrilling— not only for myself, but for those who had tutored me, and my Tibetan peers and mentors who knew the exam would be challenging even for a native Tibetan. However, it was also clear to me that this was just the beginning of the hard work that I would soon be embarking upon. I was

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[2] I will hereafter refer to as MTK for short, or D'asa MTK, for D'asa Men-Tsee-Khang. Dharamsala Men-Tsee-Khang is often referred to as D'asa Men-Tsee-Khang by locals since it has a nice parallel sound to Lhasa Mentsikhang, which it is thought to have re-established in exile.

choosing an entirely new pedagogical culture of memorization, recitation, and distinctly new ways of understanding the body.

What I did not expect is that pursuing training to become a Tibetan medical doctor would mean that my body and mind would also transform—both to gain proficiency in its diagnostic techniques and also to skillfully enact its treatment modalities. A tradition that has, through the centuries, privileged perceptual means of diagnosis implies that the doctor herself must engage in rigorous sensory and perceptual training. This was not an apparent aspect of the path when I started, but, on reflection, perhaps it should have been obvious. I was struck by the idea that while Western medicine has largely rejected perceptual means for diagnosis and instead relies on diagnostic machines as objective and valid measurements of medical reality, another tradition places great value on embodied knowledge and skill in diagnostics, treatment, and patient care.

I wanted to understand the strengths and limitations of Tibetan medicine for prevention, diagnosis, and treatment. Could this system identify subtle life-threatening illnesses in time to treat them? Or treat them differently and perhaps more successfully than Western medicine? I wanted to see if there was something that Western medicine may have lost in abandoning embodied knowledge for the sake of objectivity. It seemed that a specific epistemology and ontology was required for embodied knowledge to be accepted and validated. And it pointed toward a unique training that would be required to gain this embodied knowledge in order to be proficient at these differential diagnostics and effective treatments.

This interest drives my inquiry and shapes the focus of my doctoral research. Through my training as a Tibetan physician—memorizing the texts, learning in class, sitting for oral and written exams, gathering herbs, learning to compound medicine, apprenticing in the clinic—and, simultaneously, my training as an anthropological researcher—through immersed participant-observation, interviews, surveys—I pursue the central question: what role does embodied knowledge play in diagnosis? This work is my attempt to answer that question.

My approach to investigating this question: first, relies upon multifold sources; second, draws upon a particularly immersed form of participant-observation; and, third, integrates textual, ethnographic and clinical sources. In particular, it sees the text itself as a primary interlocutor. In this introduction, I will use several parts to describe my approach: (1) the modes of inquiry that I employed, (2) my particular textual methodology—what I call "text as key informant"—which may situate this work uniquely in anthropology, and (3) the mechanics and context of my research.

Part I. Modes of Inquiry

In his description of participant observation, anthropologist and qualitative research specialist James Spradley (1980) delineates five categories of participant observation: non-participatory, passive, moderate, active and complete. He characterizes non-participation as having no contact with the population or field of study; passive participation when the researcher is a bystander; moderate participation when the

researcher maintains a balance between “insider” and “outsider” roles; active participation when the researcher becomes a member of the group by fully embracing the skills and customs for the sake of complete comprehension; and complete participation when the researcher is completely integrated in the study population beforehand. In non-participation, the researcher is unable to build rapport with the group or ask questions as new information arises. He characterizes moderate participation as the ideal degree of detachment to remain objective while still maintaining involvement. In contrast, both active and complete participation risk the researcher “going native” as she strives for in-depth understanding of the topic investigated in the population, potentially leading to a loss of all levels of objectivity.

My work required complete participation, complete integration into my study population. In order to see whether the pedagogical methods “worked” or not, I had to try them out, and assume they did work. I had to assume that pulse diagnosis could explicate disease in subtly nuanced ways merely by the patterns I assessed underneath my fingertips. I had to assume that all my texts and mentors taught could be understood through perceptual means actually could. In order to see the processes of cultivating embodied knowledge, I had to be receptive to them being cultivated inside me, transforming me. In this sense, Spradley is correct: it risks objectivity, and in a sense, it eliminates objectivity because it fundamentally creates a new subjectivity in how one experiences and sees the world. What is objectively possible also transforms due to the development of a new means of gaining knowledge: the body as instrument itself.

Marek Kaminski (2004), a Warsaw University student who was imprisoned in Poland in 1985 for running an underground political press, took clandestine notes on prison subculture as a political prisoner himself. Released from prison in 1987, he is known for developing the approach that has been termed “observing” or “observant” participation (Bolton 1995) to describe the context in which the researcher him- or herself is a member of the population. Although I was a foreigner at both Men-Tsee-Khang and Sorig Loling, I was a student just like all my Tibetan peers undergoing the same processes of learning and inquiry. In this sense, my work might be considered what Lila Abu-Lughod (1993) terms “halfie-anthropology” or bicultural anthropology as a participant in a culture to which I partially belong.

This work also qualifies as an auto-ethnography, which is characterized as an author using her personal experience, self-reflection, and an autobiographical story to address wider sociocultural meanings and understandings (Reed-Danahay 1997; Ellis 2003; Maréchal 2010). Auto-ethnography foregrounds the subjectivity of the researcher to acknowledge its integral role in the particular empirical research. In many ways, I had an $n=1$ for my study sample in order to understand how this knowledge gets embedded through the various pedagogical processes at work. I also used interviews, surveys, formal and informal conversations with my classmates, teachers and mentors. However, many responses that I received from my interviews, conversations and trainings regarding the nature of the education processes were the same: memorize, recite and study the text, then apply it to the clinical context, integrate the oral instructions of your mentors, and conduct good Buddhist practice according to your root teacher. These instructions were

both insightful and limited as to their ability to explicate the processes underpinning the inculcation of embodied knowledge for deployment in differential diagnostics.

This work also employs grounded theory methodology (Glaser & Strauss 1967) for the generation of a theoretical framework to analyze my data. In grounded theory, as data are collected, reviewed and analyzed, recurring ideas, concepts or elements become apparent. These themes are often coded and extracted from the data. These categories become the basis for new theory to assess the data. Theory is meant to (1) to enable prediction and explanation of behavior; (2) to be useful in theoretical advance of the field; (3) to be usable in practical applications—prediction and explanation should be able to give the practitioner understanding and some control of situations; (4) to provide a perspective on behavior—a stance to be taken toward data; and (5) to guide and provide a style for research on particular areas of behavior (Glaser & Strauss 1967).

Such theory provides modes of conceptualization for describing and explaining. Because my curricular experience at both MTK and SLL explicitly integrated Buddhist logic, *pramāṇa* and, in particular as presented by the seventh century Indian Buddhist logician Dharmakīrti, on how our perception is trained and how valid knowledge is obtained through perceptual means, my data continually pointed to his work as a theoretical framework from which to analyze my focal research questions. Dharmakīrti's theory of *pramāṇa* provides the paradigmatic framework of both ontology and epistemology in which Tibetan physicians understand how diagnostic training and practice function. It allows us to predict why Tibetan physicians train in the way they train and why they use perceptual means for assessing diagnostic criteria. It contributes a

framework for understanding the development of embodied knowledge in anthropology. It is practically useful in that it allows prediction and explanation of the learning processes that Tibetan physicians undergo to develop diagnostic skill. It likewise provides a perspective on the training behavior, explaining the learning processes I assessed in my fieldwork. Finally, it guides and provides an approach for research on the embodiment processes of Tibetan medical education, framing how physicians develop these skills.

Part II. Methodological Approach

My education at MTK and SLL, like that of my peers and predecessors in Tibetan medical history, focused its pedagogical lens on the authority, insight, and capacities provided by one single text: the *Four Medical Transmissions*. In doing so, it has fundamentally sculpted the methodology that I applied in my research. As such, I found a lacunae in the history of and contemporary applications of anthropological methods that were appropriate for the context in which I found myself. The subdiscipline known as the anthropology of text (Barber 2007), and particularly the work on verbal texts, has provided valuable tools and intellectual collaborators. However, it still does not engage the aspects of intentional embodiment processes that I investigate in my work. As such, the need to articulate this specific methodology, its necessity, and its unique contribution amidst anthropology's traditional interlocutors was evident. Text as Key Informant details this aspect of my work, and provides context for the outline of chapters that comprise my efforts to answer my focal question investigating the role of embodied

knowledge in diagnosis, but even more so, *how* that embodied knowledge is cultivated and deployed.

Text as Key Informant

When the text takes the place of speech, something important occurs. In speech, the interlocutors are present not only to one another, but also to the situation, the surroundings, and the circumstantial milieu of discourse. It is in relation to this circumstantial milieu that discourse is fully meaningful; the return to reality is ultimately a return to this reality, which can be indicated 'around,' if we may say so, the instance of discourse itself.

—Paul Ricœur "What is a Text?" (1991:46)

Anthropology has a long history of seeking the perspectives of individuals and leaving other disciplines to engage the literary works of a given culture. However, my experience in the Tibetan world incites an internal tension with such a fragmented approach. In Tibetan medicine and in the wider Tibetan Buddhist context, texts provide the epistemological and ontological basis for understanding the fundamental nature of reality, framing how one makes sense of one's life and experience. The texts themselves are seen to be animated in an oral and aural space, having a living existence in themselves where one cares for them, honors them, recites them, enfolds them in exquisite cloth, and places them in positions of greatest importance. In a context where a text assumes such a central societal and cultural position, both as material object as well as the content within, I could not help but see texts as integral to anthropological fieldwork. They shape paradigms, mobilize discourse, provide primary sources and

authority for knowledge and insight, and forge experience. Texts are living, breathing, speaking entities that teach, guide and direct.

The life of the text occurs in the interactivity of the material object, the textual content, and the engagement with the text by the doctors themselves. Whether the doctors are Buddhist or Bön[3], there is a rich interstitial space in which the text is enacted. The source of the text, the words which are spoken and transmitted, is assumed to be from an enlightened being, expert in all medical knowledge, art, and skill, and uniquely adept in imparting the knowledge and healing capacities to those able to learn it.

In Leela Prasad's work (2006) based on the poetics of conduct in the *shastra* tradition of a southwestern Indian town, she makes the case for what I call "Text as Key Informant" when she describes the *shastras*, a collection of scriptural texts that direct spiritual and moral conduct. She describes them as a "theory of practice" by fusing precept with praxis (2006:21) — forming a "situatedness of narrative" (Prasad 2006:188). She says, "Sringeri stories and conversations argue that a phenomenology of *shastra* requires that we extend the widened understanding of text and textuality to recognize '*shastric* texts' also in the world of material and oral practices that are animated by human agency and function as vibrant forms of moral guidance for Hindus" (118).

In the Tibetan medical case, the text is for medical guidance and clinical function with salient insight into the physiological conditions of health and illness. In a way, just

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[3] Bön is understood as the indigenous religion of Tibet before Buddhism gained formal sponsorship under royal patronage in the eight century (Karmay 1997, 2005, 2014). Bön also practice a form of Tibetan medicine and call their canonical text the *Bümshi*,or *Four Great Verse Collections*, instead of the *Gyushi* as the *Four [Medical] Transmissions* as it is called in Tibetan. The *Bümshi* and *Gyushi* share remarkable similarity in content, structure and identical passages throughout. Controversy exists as to which text preceded the other and the true historical roots of the Tibetan medical tradition.

as Prasad's work is "an ethnographic study of the notion of *shastra*," the current work is an ethnographic study of epistemology and ontology—how engaging a text, the *Four Medical Transmissions,* and its pedagogical context enacts the diagnostic training process through lived experience of its stanzas, metaphors and poetics, and its clinical engagements with lived experience.

Prasad argues that "a dynamically constituted 'text' […] draws on and weaves together various sources of the normative—a sacred book, an exemplar, a tradition, a principle, and so on" (2006:119). Furthermore, she claims that such a text is "essentially an *imagined text*" (her emphasis; 2006:119) in which "a fluid 'text' that engages precept and practice [is] always intermediary […] situated in the local and the larger-than-local, the historical, and the interpersonal" (2006:119). In the Tibetan medical context, the *Four Medical Transmissions* as a text is both real and imaginary, literal and evoked. It interacts with the physician's experience memorizing and reciting the text, layering in personal and interpersonal experience, clinical case exposure, contemplation and counter-evidence. It is a discursive root upon which praxis knowledge is interwoven and anchored. Edward Said describes the interplay between Quranic text and circumstantiality as a "constitutive interaction" (Said 1983:38). It is an *imagined text* which Prasad explains as "each individual puts together commingling memory with implicit learning and teaching" (Prasad 2006:144).

The same dynamic occurs for Tibetan medicine and physicians' "constitutive interaction" with the *Four Medical Transmissions*. The layers of interpretation and oral instruction provided by one's teacher and his related sub-tradition as well as one's own

experience, clinical exposure and implicit learning, constitute the meaning of those stanzas such that when they are "conjured into mid-air," one can aptly describe meaning with rich exemplars and descriptions.

My first exposure to this lived experience of the text was during clinical sessions with *amchis*[4] where, when asked a question about an illness, its causes, the treatment and so forth, an *amchi* would invariably quote stanzas from the *Four Medical Transmissions*.

> *Rlung* exacerbates both hot and cold conditions
>
> Accompanying the sun, it facilitates burning
>
> Accompanying the moon, it facilitates cooling
>
> Inciting all, it drives upper, lower, external and internal illness
>
> It disturbs and provokes manifestation of both hot and cold disorders
>
> Thus, *rlung* is the cause of all illness[5]

Rlung is often translated as "wind" and corresponds to the internal functional pathways in the body that can be thought of as similar to neuroendocrine pathways since *rlung* is understood as all motility in the body. It also corresponds to external wind in the environment and the relationship vis-à-vis breath and the mind since the mind is seen to ride on rlung pathways like a rider on a horse. Rlung pathways can also experience dysfunction when imbalanced similar to aberrations in neuroendocrine signal production and transmission. At first, this practice of responding to questions by citing verbatim

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[4] "*Amchi*" is the term used in Central Tibet and throughout exile Tibetan populations to refer to Tibetan physicians. Although it is originally a Mongolian word, it has populated the Tibetan vernacular and is the term used most commonly to refer to Tibetan physicians in these regions. The Tibetan term for physician "*menpa*" is used more commonly in eastern regions of Tibet, such as Amdo and Kham. Although the pluralization of *amchi* is the same term, in my transliterations I have chosen to add an "s" to retain the English convention for reading ease.

[5] རླུང་ནི་ཚ་གྲང་གཉིས་ཀའི་ཁྱབ་བྱེད་དེ། ཉི་མར་ལྡན་ན་བསྐྱེད་བྱེད་ཅིང་། ཟླ་བར་ལྡན་ན་བསིལ་བའི་བྱོེད་བྱེད་ལ། སྟེང་སྨད་ཕྱི་ནང་མ་ཡུལ་ཁྱབ་བར་རླུ། ཚ་གྲང་གཉིས་ཀ་འཁྲུག་ཅིང་སྐྱོང་བར་བྱེད། དེ་བས་རླུང་ནི་ནད་ཀུན་མ་ཡུལ་རླུ། (TII, Ch 8; Yuthog Yonten Gönpo 1999:72). All translations done by author unless otherwise noted.

stanzas from the text seemed to me a convenient diversion from the *amchi* needing to give his or her own reflective response. Coming from a Western perspective that privileges the individual's own understanding of knowledge, digested in such a way that could only be uniquely explained by that individual, I found the approach of simply quoting the text to be lazy and avoiding a well-crafted answer from one's own understanding of the text. However, as I accumulated time memorizing the text and becoming familiar with its stanzas, poetics, and metaphors, I realized that the stanzas illuminated clinical particularities in vast and perspicacious ways so that it was most instructive to call up the text precisely with the relevant stanzas in order to reflect on how the particular clinical situation or experience fits into the larger understanding of the medical theory and adds depth to those specific stanzas.

In almost any circumstance, an *amchi* consults the root text, like referring to one's most beloved teacher, the authority to impart proper understanding. My teachers often reminded me[6] that the beloved teacher speaks, as all wise masters are apt to do, in metaphor and poetic meaning such that one phrase can apply to many situations, distilling meaning to a similar essence. As such, the more experience one gains, the more layers of meaning are woven into specific stanzas and phrases such that the stanzas themselves carry greater insight the more one practices and engages with the text. It is as if the meaning of the text comes from the interactivity of the "reader" and "the read" — a richly invoked manifestation of meaning in the in-between.

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[6] My teachers, classmates and friends in the community would describe how the great adepts of history were understood to speak in melodic poetry and metaphor not the unrhythmic and largely monotone prose in which we speak today (Choezom 2012). I have yet to locate a textual reference for this widely held conception.

Throughout Tibetan medical history, hundreds of commentaries have been written on the *Four Medical Transmissions* by experts, highly experienced physicians, and insightful scholars. However, the commentaries are seen as mere opinions and valued perspectives, always open to revision, error, and misunderstanding (cf, Czaja 2007). They must be re-evaluated with each new era, compared to the standard of the root text held as authority in conjunction with the practical reality of amassed clinical practice and experience. It is the latter, the clinical practice, which provides layers of insight into the root text meaning and determines whether the commentaries are valid or not. Likewise, as one of my close clinical mentors Dr. Dontse would say, the text is written in ambiguities and trickster ways so as to make sure that the practitioner is one who can see through any contradictions by rigorous study, understands the trickster sections through experience and proper oral instruction, and has proven good intention to properly apply the medical content for the benefit of patients. The teacher evaluates the suitability of the student— her intentions to study medicine and her capacity to do so successfully. This is described as the "suitability of the vessel," a metaphor used in both Tibetan Buddhism and Tibetan medicine to describe the qualities a teacher seeks in a proper student.

For both teacher and student, the text is one's most trusted guide in the learning process, and intermediary as well as authority in the teacher-student relationship. It is also a tool through which embodiment occurs vis-à-vis memorizing and reciting its stanzas, layering in clinical experience, as well as daily engagement with one's own phenomenological insights of its paradigms and insights. Through this work, I will

demonstrate how the text itself is my key informant, as well as the key pedagogical tool for how embodiment occurs in creating Tibetan physician as diagnostic tool.

Part III. Mechanics and Context

In this final part, I show how the modes of inquiry and the particular methodological approach I presented above is implemented in my research. This section introduces the details and mechanics of my methodology. I also introduce the Four Medical Transmissions as our primary text, the context of my daily schedule, and our curriculum progressions at MTK and SLL to provide a window into the particulars of the participant-observer experience and how I obtained my other data sources.

Methodology

This work draws upon a multiplicity of data sources, but can be condensed into four main categories: participant-observation ethnography, textual analysis, clinical patient diagnostics data analysis, and semi-formal interviews and surveys.

Participant-observation. First, my position as a medical student alongside my Tibetan counterparts provided a thoroughly integrated quality of participant-observation. Thus, such experiences, observations and conversations with classmates and teachers provide the bulk of my data. As I described above, in my work, there was no option but complete participation, and complete acceptance of the pedagogical methods in order to see whether or not it "worked." In essence, in order to determine if one could assess anything more than heart beat through feeling the pulse, I had to assume that one could

perceive everything the text and my mentors indicated could be assessed and approach the subject matter from that basic assumption. Clearly, this risks objectivity. However, in a mode such as embodied knowledge, a receptivity to the transformation processes is the only way such knowledge can infuse into the subject[7].

The participant-observation segment of my data collection occurred over five years: four years of classes, memorization, textual study, practica, and written and oral exams; and one and a half years of semi-overlapping integrated internship during my coursework, apprenticeships with various senior physicians, and a formal internship. The participant-observation has continued into my own practice as a Tibetan physician seeing patients of my own back in Atlanta for the two years since I graduated from Tibetan medical school. My field notes comprised notes I took during class sessions, in the clinic, alongside my memorization, in botanical field expeditions, and in specialty workshops and mentoring sessions. I often wrote or audio-recorded reflections after these sessions to note important observations and themes.

As a student enrolled at Men-Tsee-Khang (MTK) and Sorig Loling (SLL, the school in Amdo to which I transferred after my second year), I audio-recorded every class throughout my education. However, for my research, I tagged specific classes that were particularly pertinent to my research questions. For example, I tagged the class from mid-May 2010 that Dr. Yeshe Gelek taught on the fourth chapter of the *Root Transmission* of our canonical text, which provides a summary of diagnosis in Tibetan medicine. I transcribed this class recording, coded and analyzed it for diagnostic instruction and the

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[7] See the corollary in Konner's ethnography of *Becoming a Doctor* in Western medicine where he speaks of sacrificing objectivity due to his membership in the cultural context he was studying (1987:xv).

corporeal, metaphorical and perceptual cues relayed to students for illness recognition through pulse. Similarly, formal and informal mentoring sessions often occurred with faculty and senior physicians at both MTK and SLL. As such, I recorded, coded, and analyzed pertinent sessions.

Textual analysis. Secondly, this work draws on the textual bases for education in Tibetan medicine and Tibetan scholasticism in general. As a student, I gained rigorous familiarity with the primary medical texts and related commentaries. During my education, I also paid particular attention to textual references for diagnosis and the attendant learning processes, as well as the specific diagnostic criteria for an area in which I focused my attention for my Tibetan medical *kachupa*-equivalent degree[8] graduating thesis: indigenous forms of cancer such as *dré-né*[9], *tren*[10] and the related metabolic (*mazhuwa*[11]) conditions[12]. Producing my thesis, a 25-page primary research study, which I wrote in Tibetan similar to all my classmates, as part of my Tibetan medical education, provided another dimension to what I was assessing in terms of the

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[8] Equivalent to a bachelor's degree in Tibetan medicine. The *kachupa* (དཀའ་བཅུ་པ།) rank was traditionally part of the *geshe* degree (e.g., at Tashi Lhunpo monastery) in which one endured the ten ascetical hardships, or could expand on multiple interpretations of the textual canon. In the monastic context, it would be a basic study of the five *kapö* (དཀའ་བོད་ལྔ།), the five kinds of difficult [teachings]: logic (ཚད་མ།), *mādhyamika* (དབུ་མ།), *prajñāpāramitā* (ཕར་ཕྱིན།), *abhidharma* (མངོན་པ་མཛོད།), and *vinaya* (འདུལ་བ།) (THLIB 2017). Sarat Chandra Das defines *kachupa* as referencing "a Buddhist scholar who has acquired such great proficiency in sacred literature as to be able to interpret the meanings of a term in ten different ways" (1902:50). In the Tibetan medical context, it indicates a complete study of the *Four Medical Transmissions* (རྒྱུད་བཞི།) and the primary commentaries.

[9] འབྲས་ནད།

[10] སྐྲན།

[11] མ་ཞུ་བ།

[12] My graduating thesis for Sorig Loling Tibetan Medical College, which is a 25-page analysis I wrote in Tibetan for our graduation requirement, was published as an article in April 2017 in Lhasa in the Journal of Tibetan Medicine and Research, the highest provincial level journal of the Tibetan Autonomous Region (T.A.R.). See Bibliography (Tidwell 2017), for full reference.

processes of cultivating embodied knowledge. This form of pursuing and presenting knowledge was familiar to me from my Western educational background and allowed me to reflect on and articulate some of the central processes I was observing in terms of how the patient embodies various disease processes and causal conditions, and how those are assessed and articulated diagnostically in Tibetan medicine when the primary means of diagnostic evidence is perceptual cues. This provided a central contrast between Western medical conventions about what counts as "method" and "evidence" compared to those in Tibetan medicine. Whereas the Western medical presentation of cancer relied on the cellular characteristics and functions, Tibetan medical assessments of the disease focused on the systemic production of a specific constellation of symptoms from the physiologic pathways it recognizes. This comparative work also allowed me to see how Tibetan medicine "divides up the body differently." Whereas Western medicine delineates the body according to specific physiologic systems that we understand intimately interrelate, Tibetan medicine has its own physiologic systems it delineates and tracks. Notions such as how a condition is described as "cold" versus "hot" also became more apparent in looking at cancer and the respective conditions in Tibetan medicine.

The foundational text of our medical curriculum is the *Four Medical Transmissions*.[13] It is a book of almost 800 pages split into four sections: the *Root*, *Explanatory*, *Oral Instructions,* and *Subsequent Transmissions*. The *Root Transmission*

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[13] The text is known as the *Gyushi* (རྒྱུད་བཞི།) in Tibetan. It translates directly as the *Four Tantras*, but has often been translated as the *Four Treatises* or *Four Medical Tantras/Four Medical Treatises* to clarify its medical content. I choose to translate the term *gyu* as "transmission" due to the ambiguity of the term, which is used for tantra, transmission, and stream. I find that "transmission" retains the understanding that each of the four texts have different functions and are seen as transmitted teachings for different levels of understanding the content.

contains six chapters and is considered a pithy summary of the entire medical theory. The *Explanatory Transmission* establishes the main theoretical foundations of Tibetan medicine. The *Oral Instructions Transmission* is by far the largest section of 92 chapters containing encyclopedic information on the causes, symptoms and treatments for the various illnesses. And the *Subsequent Transmission* provides detailed information on pulse and urine analysis, medicine compounding and the external therapies. The *Root*, *Explanatory* and *Subsequent Transmissions* need to be memorized, along with the causes and conditions, symptoms and treatment approaches of each chapter in the *Oral Instructions Transmission*. See the appendix for a table delineating the contents of the *Four Medical Transmissions* and its related subsections.

Students are expected to thoroughly know the textual content from the *Four Medical Transmissions*. For my analysis, I drew most significantly from the chapters on anatomy, physiology, pathology, etiological classifications, diagnostic theory, and pulse and urine analysis. See the Appendices for the full contents and structure for the *Four Medical Transmissions*, and for a list of these specific chapters pertinent to my analysis.

Supporting the *Four Medical Transmissions* are numerous commentary texts that have been composed throughout the centuries, including a more recent commentary by the renowned lama physician Troru Tsenam Rinpoche, who passed away in Lhasa a few years ago. Students are expected to know his commentary and three other highly regarded commentaries, as well as all the discrepancies among the commentaries in explicating the canon. These four commentaries are:

- *Blue Beryl* by Desi Sangye Gyatso (16th century CE)

- *Oral Instructions of the Ancestors* by Lodroe Gyalpo (circa 13th century CE)
- *Oral Instructions of the Sages* by Troru Tsenam Rinpoche (20th century CE)
- *Explanatory Allegorical Trees* [*of Health and Disease*] by Khenrab Norbu Rinpoche (20th century CE)

Other important commentaries from which I draw include: *Eight Branches* by Loben Bawo (4th century CE), *Rays of the Moon* by Indian paṇḍita Kachepanchen Dawa Ngonga (12th cent CE)[14], *Embellishment of Realization* by Yuthog Yonten Gonpo (12th century CE), *Fundamental Treatise on the Middle Way* by Nāgārjuna (2nd century CE); *Commentary on Valid Cognition* by Dharmakīrti (7th century CE), and several more contemporary writings specific to pulse diagnosis, medicinal plants, compounding medicine, and so forth. See the appendix for a list of figures, the root texts, and commentaries that are relevant to Tibetan medicine and Tibetan medical education. As students, we were expected to be familiar with these texts but were not held responsible for their contents on examinations.

For my textual data sources, I also draw upon treatises and hagiographic biographies (*namthars*) that provide explicit and implicit instructions on how to study and become adept in Tibetan medicine. The latter category has a larger-than-life element on par with legends and myths that shape an idealized caricature of a role model to

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[14] Śākyaśrībhadra (ཤཱཀྱ་ཤྲཱིབྷ་དྲ།) (1127-1225), the last abbot of the great Nālānda Monastery, center of Buddhist learning, before it was destroyed by Muslim invaders in 1192. He arrived in Tibet in 1204 by the invitation of Tropu Lotsāwa Rinchen Sengge (b1173). Śākyaśrī is said to have given teachings on logic and epistemology to Sakya Paṇḍita Kung Gyeltsen (*Treasury of Lives* p2810; TBRC P1518) This detail will play an important role in later chapters of this work regarding the tandem transmission of logic and transmission of medicine in Tibetan history and their integration in framing the epistemology and ontology for Tibetan medicine. Śākyaśrī is also said to have given teachings to Sakya Paṇḍita Kung Gyeltsen on Kālacakra, Vinaya, linguistics, and poetics as well (Gardner 2011: 2810). Śākyaśrī is credited with founding the tradition of logic among the Sakyas (*Treasury of Lives* p2810).

demonstrate the qualities one should cultivate in developing into a great Tibetan medical physician.

Clinical patient diagnostics data. The third source of data draws from the one and a half years of internship at the Qinghai Provincial Tibetan Medical Hospital where I conducted patient rounds in gastroenterology with my senior physician mentors four days per week and outpatient one day per week. I often had the opportunity to observe a hundred patients' pulses, urine samples and diagnostics in a given morning before heading to class mid-morning for the rest of the day. Patient medical records in Chinese and Tibetan for diagnostics and treatment in biomedical and Tibetan medical modalities, respectively, as well as my own notes of observations and teaching moments during patient rounds, comprised this data source. I compared my personal diagnostics with each case to the patient record on file for close to 500 cases.

The clinical sessions exposed me to a wide range of conditions. However, I focused my attention on recording, transcribing and analyzing the *dré-né*, *tren* and related *mazhuwa* conditions. As stated above in reference to my graduating Tibetan medical thesis, the role analyzing how these conditions relate to biomedical cancer helped me to reflect on how Tibetan medicine views the embodiment processes of disease etiologies in the patient, and what information Tibetan medicine prioritizes in its diagnostics. It helped me see more clearly the delineation of physiologies and pathways in Tibetan medicine, and the pervasive integration of the psychological and physical in symptoms, diagnostics and treatments. Whereas Western medical diagnostics can privilege a single tumor marker that indicates the cellular metabolites of abnormal cell growth, Tibetan medicine tends to

look at systemic processes even in differential diagnostics, such as pulse qualities that may be further downstream from the affected organ or tissue.

Surveys and interviews. In the summer of 2011, I collected five surveys from all my classmates (n=40), faculty (n=13) and several senior doctors (n=15) at Men-Tsee-Khang, Sorig Loling, and the Qinghai Tibetan medical hospital. The surveys comprise: (1) demographics, (2) educational background, (3) medical practice profile and experience, (4) Buddhist practice exposure and application, and (5) stressful life events assessment. These surveys allowed me to form a general sense of foundational learning processes and paradigms, education background and experience, patient case exposure, and expertise. These surveys provided a context for me to compare and contrast educational background and diagnostic methods.

I also conducted informal interviews with faculty and classmates at Men-Tsee-Khang and Sorig Loling regarding their learning experiences with diagnosis. I distinguished this category from mentoring sessions with faculty and senior doctors because the aim in these interviews was to hear about their own learning experiences, instead of how faculty are teaching me and my classmates. Interviews with classmates also allowed me to understand how my classmates were understanding and applying the teachings they were receiving.

I conducted expert physician clinical interviews and observations at Men-Tsee-Khang beginning in late February 2011 and at Sorig Loling and the Qinghai Provincial Tibetan Medical Hospital in January 2012 and during my longer residence in Xining August 2013 through July 2015.

Study Group: my peers, instructors, and mentors

My study group was comprised of students, faculty, and senior physicians (Amchi Khenrab, Menpa Lugyal, Menpa Dontse, Menpa Namlhakhar, Menpa Takdrug Tserang) with whom I interned, as well as three expert physicians (Amchi Yeshe Dhonden, Amchi Tamdin, Aku Nyima). At Men-Tsee-Khang there were two classes of about 25 students in each class, where one class would start one year before the second class and both classes would proceed for five years till internship. Both classes were roughly half male and half female, with the upper class originating from Indian-born Tibetans coming from exile settlements. My class was primarily from Tibet with each major province of Tibet fairly evenly represented, and four Indian-born Tibetan students from exile settlements. The composition of these two classes was coincidental. In the two subsequent classes that entered Men-Tsee-Khang in later years, there was a more even split between Indian-born and Tibet-born students. Each class had two to three students from Nepal, Mustang, and Ladakh— ethnically Tibetan Himalayan regions. The upper-class had two Russian students, both ethnically Tibetan (Kalmyk and Tuva). My class had one Russian student who is ethnically Georgian-Armenian but grew up in Russia. The upper class age ranged from 24 to 29, with the average around age 26; and the lower class from 18 to 27, with the average around age 23. Each class also had three to five astrology students who took their classes separately.

At Men-Tsee-Khang, nine faculty taught on average two to three times per week. There were four classes per day, six days a week. Two classes per week were devoted to

Buddhist logic. One class per week concerned medicine-related astrology, that is, astrological influences that create a proclivity for a patient to have certain illnesses or particularly negative social-environmental influences for their constitution. The rest of the classes were taught on each chapter of the medical canon texts, where a given professor taught several chapters from the *Root* or *Explanatory Transmissions* and individually decided how to distribute the content of their section over the term (i.e., not sequentially through the text). We sat for three-day written tests approximately every two months with ten to twelve questions to which we would respond in essay form. We had two oral exams per year where we recited memorized portions of the medical canon, often taking an hour or more per student to complete each section.

The final cumulative exams at MTK are administered before the internship and cover content from across the five years of coursework. Various special workshops on treatment modalities, diagnostics and plant recognition are also given at the end of the final year.

Although I did not do my internship at MTK, I tracked my classmates remotely during their internships since we were in touch by social media[15]. Students were paired in couples and assigned to a clinic in India and Nepal. They stayed in that location for an entire year before returning for commencement. Two-thirds of my classmates made it to graduation. One-third ended their studies early to accept visa opportunities to Australia,

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[15] Social media is a primary method that the Tibetan and Chinese community communicate, share information, and engage in professional and personal conversation. Unexpectedly, it became a substantial method for discussing cases with my mentors when I returned to Atlanta, and staying in touch with classmates both in Dharamsala and in Xining. Various doctors groups were formed where they shared patient cases and treatments. It became an interesting and increasingly significant source of data collection for me as I entered further into my studies and research.

South Korea, or to return to Tibet. A thesis was not required, but many were encouraged to either publish a book or recite three of the four sections of the *Four Medical Transmissions* as a mark of graduating with honors. One of my classmates recited the *Three Transmissions* (*Root*, *Explanatory* and *Subsequent Transmissions*), and two of my classmates published books.

At Sorig Loling, I was a member of the 2011 entering Tibetan medical doctor class overseen by Dr. Choying Rangdrol. I also took several classes with the 2012 class overseen by Dr. Tashi Dhondup. Sorig Loling entered classes annually, sometimes multiple entering classes: a Tibetan medical doctor class, a Tibetan-Western doctor combined class, pharmacology class, and at times, a nursing class. Both of the classes that I did my coursework with had approximately 60 students, comprising 10-12 from Yushu, 4-6 from the Ü-Tsang (TAR) region, and the rest from the local Amdo region. The classes were evenly split between men and women. At SLL, classes were taught by subject, often aligning with a major categorical heading in each transmission. For example, the *Oral Instructions Transmission* is divid*ed into compendiums such as Internal Illnesses, Hot Illnesses and so forth, and the Explanatory Transmission* is divided into topics such as Anatomy and Physiology, Pathology, Pharmacology, Diagnostics, and so forth. A class covered the material for the topic headings of the text. This was a different approach than at MTK. Each professor at SLL was responsible for getting through the entire subject by the end of the semester since the school was part of the larger context of Qinghai University. Standards similar to Western universities were expected and measured for each class.

Memorization requirements at SLL were similar to those at MTK, except that at SLL we could give our oral recitation early in the semester, and the content-based exams were at the end of the semester — the opposite of MTK. Astrology was taught as an entirely separate course with examinations, as was Buddhist Logic.

At SLL, students were assigned to departments in the Qinghai Provincial Tibetan Medical Hospital to do three-week internship rounds over the course of a year, along with one session at the Number Two Hospital, a biomedical hospital across from our college that is one of the best in Xining. One of the rounds was also in the Pharmacy, where we learned how to make various medicines. Toward the end of the year, students were given time away from their internship to work on their graduating thesis, an important part of the final requirements. There were three final cumulative exams after the internship, in contrast to MTK, which holds three weeks of final examinations, and a presentation and submission of one's graduating thesis, which MTK does not require.

My internship extended longer than that of my classmates. Because I was a foreigner and not required to take the classes on biomedicine and social history and politics, I was understood to have more time and was given permission to intern in the mornings before class commenced each day. So, for the duration of my time at SLL, I had internship integrated into my education experience. This exceptionality to my experience likely impacted what and how I learned. I became quite familiar and comfortable with patient interactions a year prior to my classmates at SLL, and several years prior to when my MTK classmates interacted with patients. I found that this clinical experience directed the questions I asked teachers in class, and framed how I understood

the text and what came to mind while reciting the text[16]. For the first year, I conducted patient rounds with my mentors in the gastroenterology department four days per week, and one day per week in the outpatient clinic. In the final six months of my time, I did the classic three-week rounds through all departments, except gynecology since I had stayed in gynecology during the month winter break I came from MTK to Xining in January 2012. The doctors in each of my departments, but particularly in gastroenterology, became the focus of my study group[17].

Coding

Throughout the classroom, mentoring and interview sessions, various instructions were given as to how one learns diagnosis, particularly with pulse and urine analysis. With such sessions recorded and transcribed, I coded the data for corporeal, metaphorical, and perceptual cues as to how one deciphers sensory data. For example, a pulse with *rlung* characteristics is considered to be hollow, floating, and intermittent in its rhythm. I coded for these qualities as tactile descriptors; and for urine with *rlung* characteristics,

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[16] In Chapter 7, I will discuss how my integrated clinical and classroom experience was more akin to the experience of medical students at Lhasa Mentsikhang in the early 1900s

[17] The expert physicians I focused on include: (A) in Dharamsala (MTK and surrounds): Dr. Khenrab Gyamtso (senior physician, Vice Principal of Men-Tsee-Khang College, my first Tibetan medical teacher); Dr. Yeshe Dhonden (renowned expert in Dharamsala, oldest living doctor in exile); Dr. Tamdin (current personal physician to the Dalai Lama, former director of Men-Tsee-Khang); (B) in Xining (SLL and Qinghai Provincial Tibetan Medical Hospital): Aku Nyima (renowned expert in Amdo, oldest living doctor in Amdo, founder of Qinghai Provincial Tibetan Medical Hospital, conducts all the blessings and rituals, directs all medicine procurement, compounding, and quality in the pharmacy; sees patients in outpatient department every morning); Dr Lugyal and Dr. Tagdug Tserang (and their team of nine junior physicians) of gastroenterology; Dr. Dontse (senior physician, outpatient head of gastroenterology); Dr. Namlhakhar (senior physician, expert in diagnostics, outpatient head of tumor department). I also learned from: (A) in Dharamsala: Dr. Lobsang (just arrived in India; trained at Lhasa Mentsikhang; mentored under the most renowned lama-doctor of the modern era Troru Tsenam Rinpoche; and is a lineage doctor (i.e., paternal line are all Tibetan physicians) trained under his father); and (B) in Xining: Dr. Tsochi (and her junior physician team) of gynecology at Qinghai Provincial Tibetan Medical Hospital.

minimal bubbles, absence of particles and water-like appearance I coded as visual descriptors. Metaphors occur throughout the *Tibetan Medical Transmissions* and are referenced in teaching moments as well as for evidence of a given diagnosis with a patient. I categorized and coded these metaphors for each sensory modality (visual, tactile, olfactory, gustatory, auditory, mental). Likewise, I coded instructions such as "self-familiarization" in one's own pulse, urine and characteristics that provide the constitutional qualities of one's self, as well as perturbations due to illness, lack of sleep, strong emotions, and other affects and influences.

In the case of *dré-né*, a pulse indicating a tumor is described as "weak"[18] and "lame"[19]. Such a pulse will show up in one of twelve areas of the fingers corresponding to an organ or pathway (e.g., heart, lungs, small intestine, large intestine, spleen, stomach, kidneys, urinary bladder, reproductive organs) and then will be linked with a functional energy system (e.g., *rlung*, *tripa*, *béken*) that details which physiologic systems are affected and how. I coded how physicians described what they are feeling, seeing, experiencing for a given patient, and the training methods they used to get to their current diagnostic skill, particularly in familiarizing the constitutional and seasonal pulses, and recognizing each layer and aspect of the pulse. Most of these descriptions from mentors came in metaphorical descriptions quoted directly from the *Four Medical Transmissions*, with related physiological associations and perceptual cues. I noted their descriptions as well as observations in how they go about the diagnosis.

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[18] ཞན་པ།

[19] ཞར་བ།

I also collected the medical records of close to 500 patient cases, all of whom I saw as patients with my mentors. I coded the records with my own notes of my diagnosis assessment and any instructions given by my mentor. This allowed me to look at resonance and consistency with my diagnostics compared to those I saw later in the patient file for any given patient. This also allowed me to compare the Tibetan medical and Western diagnoses since all patients in the Qinghai Tibetan Medical Hospital receive both a Tibetan medical and Western medical diagnosis. It provided context to reflect on the intersections of the two systems' diagnostic approaches and was quite helpful to my own learning process. I also photographed urine samples and occasionally other diagnostic features such as tongue, eyes, skin and so forth.

Daily Schedule at Men-Tsee-Khang

At Men-Tsee-Khang, we had four hours of class each day moving through the various sections of the *Four Medical Transmissions* by topic. Individually, we would pack our early mornings and evenings with memorization of new material from the *Four Medical Transmissions* and recitation of chapters we had already memorized. My classmates and I seemed to average three hours of memorization-recitation daily when not leading up to an oral exam. As the oral exams drew near, hours spent memorizing could reach eight to ten hours daily. I found that the time I required to memorize a given page was time and a half that of my Tibetan classmates, except Inga, my Russian Armenian classmate, who averaged similar times to me. Each morning and evening all students of both classes would assemble in the main prayer hall to do prayers and mantra

recitations. In the afternoon, there were often various scheduled lectures or additional classes[20]. Debate was held in the evening several times a week. We squeezed in reading commentaries and reviewing our class notes in the minimal spare time. See the appendix for a table of the complete daily schedule.

The annual schedule at Men-Tsee-Khang comprised of classes March through December with a one-month August medicinal plant expedition. We had winter vacation January and February. See the appendix for a table of the annual schedule with my activities marked throughout my time at Men-Tsee-Khang.

Daily Schedule at Sorig Loling

At Sorig Loling, the schedule was arranged much like many Western universities as a block schedule with classes in the morning and after scheduled by topic. The schedule changed depending on the semester and subjects taught for that term. Often I did not have my first class till mid-morning so I did patient rounds with my mentors in the gastroenterology department of the Tibetan medical hospital immediately in the morning and then took a bus to school for my first class. I did memorization in the morning before rounds and in the evenings when I returned home. I lived across from the Tibetan hospital, which made this schedule easy to maintain. My classmates lived on campus, which did make it more challenging to get to know them compared to my MTK classmates. I did, however, get to know my mentors at the Tibetan hospital well because of the many hours I spent there in mornings and on weekends. My classmates often had

[20] Batch 18 began a schedule with afternoon class daily: twice per week Buddhist philosophy, three times per week science (Inga 2017).

other classes, such as biomedicine and social political history, first class periods in the morning, which I did not need to attend.

Similar to at MTK, my classmates at SLL and I memorized in the mornings and evenings, and many times in all spare moments between classes and meal breaks. As far as I could tell from my own observations and talking with my classmates, hours spent memorizing among students at both MTK and SLL were quite similar. However, a key difference is that SLL does not require the oral exams at the end of the year, so the number of hours one has to invest to review material for that final major oral exam was greatly reduced in SLL, and students were able to invest more time in studying the text and commentaries. I also found that I had more time for reviewing content. Since we did not have as many additional lectures at SLL as we did at MTK, much of the time I would have spent in lecture, I used for clinical apprenticeship. I spent close to two hours seeing patients daily with my mentors, and six hours on Saturdays. I averaged 3 to 5 hours of memorization per day. See the appendix for a table of the daily schedule at SLL and that which I maintained.

The annual schedule at Sorig Loling comprised of classes from August through June, and a long winter holiday over the spring festival—January and February—similar to that of Men-Tsee-Khang. In July, students entering their third year go on a two-week medicinal plant expedition. I attended the multi-day medicinal plant expeditions run by the hospital. The hospital also often had guest lectures and workshops by senior physicians from different regions, as well as transmissions, empowerments, and teachings. I tried to attend these whenever it did not conflict with my classes. These were

special opportunities. See the appendix for a table of the annual schedule at SLL along with my activities noted.

Curricular Progression at Men-Tsee-Khang and Sorig Loling

The curricular progressions at Men-Tsee-Khang and Sorig Loling are similar. At MTK, it takes five years to complete, and at SLL it takes four years. My personal progress took four years due to my ability to take a couple upper division classes while at SLL since I did not need to take the biomedicine or social political theory courses required of my classmates. Also, at MTK, the classroom teaching proceeds more slowly than at SLL, hence requiring an extra year. Both MTK and SLL require one year internships. SLL requires a thesis, a final three-day cumulative graduating exam and a separate medical board exam for national licensure. MTK does not require a thesis, but encourages its students to recite two or three out of the four transmissions in the Four Medical Transmissions upon graduating or publish a book to graduate with honors. MTK has a three-week final cumulative exam and no medical board exam. SLL encourages its students to recite two or three out of the four transmissions in the Four Medical Transmissions at any point during their medical education. SLL produced more students who accomplished this recitation than MTK during the years I tracked.

Focal questions

Investigating my central question—what role does embodied knowledge play in diagnosis—led to several other sub-questions that provided organizing windows to my

data. There are two analytical subjects to which my inquiry of embodiment applies: the physician as embodied diagnostic instrument, and the patient as embodying various disease processes and etiologies. Thus, my questions are as follows:

1. What are the disease processes that Tibetan diagnostics is assessing? That is, what is the view of the body, view of health, and the view of disease in Tibetan medicine?
2. How does Tibetan medicine understand and assess points and trajectories in these processes?
3. How is embodied knowledge cultivated for deployment of these skills? What are the processes and stages of entrainment?

The first subquestion relates to the patient—the embodiment of disease processes and causal pathways in the patient. The second question relates to the interaction between physician and patient—the mechanics of Tibetan medical diagnostics as intermediary between physician as embodied diagnostic tool and patient as embodied diagnostic object. The third question relates to the physician—embodiment processes in creating physician as diagnostic instrument. There are many questions that stem from these three

focal subquestions[21]; however, all questions return to the central question and its three focal subquestions.

Hypotheses

Three main hypotheses drove my inquiry:

Hypothesis 1. I hypothesized that, in accord with Buddhist epistemology, the mind is treated as a sense like any other sense (sight, hearing, smell, taste, and touch). Therefore, textual study is not privileged; it is considered one part of training all the senses, and shapes what and how the senses can and will perceive. Likewise, memorization practice is not just for training the mind, but provides systematic patterning of the senses to see the relationships of the functional energy systems that Tibetan medicine calls *nyépa*[22] and their related qualities in the body, food, medicine, environment and social relationships. As such, memorization plays a different role in Tibetan medical education than in contemporary Western medical education. In the latter, memorization and textual study are part of the "knowledge assembly line" (Konner

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[21] Some of the subsidiary questions that I explored during my research include: (1) What are the primary learning processes in developing sensory perceptual acuity in Tibetan medical diagnostics? Particularly, how are pulse diagnosis and urine analysis trained? That is, what do the teachers do to teach and what do the students do to learn? (2) How do physicians describe pulse and urine characteristics? Physiological cues? Appearances? Mental states? What metaphors are used? What descriptors are employed? How do mentors confirm student findings? How do students apply mentor corrections? When do instructions or descriptions deviate from the text? (3) What other teaching tools are used in the pedagogy, such as visual aids (*thangkas*, medical and botanical drawings); recitation recordings; medicinal plant identification, gathering and compounding; external mentoring access and so forth? (4) What are the pedagogical layers in this training? (5) What are the stages of learning? How is the function of each stage described? How do students experience each stage? (6) How does conceptualization of the body affect perception of the body? How are body-mind relationships understood and differentiated? How are such body-mind relationships employed in diagnosis? (7) To what degree can Tibetan physicians diagnose types of biomedical cancer, peptic ulcers, liver disease and so forth via pulse diagnosis and urinalysis? To what degree do they rely on the patient interview and/or biomedical diagnostics?

[22] ཉེས་པ།

1987:14) of medical science from which one applies practical experience to forge one's own approach to crafting care[23]. In the former, memorization initiates and induces sensory training experience, primes the development of medical and naturalist knowledge, as well as cultivates the emotional skills of the doctor to produce her own therapeutic relationship with the patient.

Hypothesis 2. I hypothesized that senior Tibetan physicians who are able to diagnosis specific physiologic conditions such as stomach ulcers, cancer, etc., do so via a process of sensitization to physiologic data and habitus. However, medical texts provide guidelines of symptoms such that younger doctors proceed initially from tracking the symptoms, and then layer in patterns of sensory data and habitus specific to each patient case. Gradually, the trajectory toward expertise becomes a gradual process of linking the symptomology to the sensory data (primarily tongue, eyes, pulse, urine and overall habitus).

Hypothesis 3. I hypothesized that the sensory sensitization, self-introspection, and systematic tracking of mind-body-environment-social interrelationships cultivates empathy among Tibetan physicians such that (1) diagnosis depends on such empathic qualities, and (2) physicians consider themselves as part of the healing process. This perspective also plays a major role in an integrative therapeutic approach that cares for the patient's physical, mental, and emotional well-being.

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[23] Konner writes this perspective from the words of his mentor, Harold Greenspan, chief of service in Galen department of medicine and author of cardiology and medicine textbooks: "You never conquer the whole mass. But you make these little inroads, a patient at a time. You read where you have to read, a chapter here, a chapter, there, and one day you turn around and you know a tremendous amount of medicine. But you must read in relation to your patients, or it will just never stick in your mind" (1987:262).

Chapter Summaries

This work begins with Chapter 1 as a theoretical framework through which I outline the historical roots in anthropology of conceptualizing embodiment and the interrelated physiologic, psychologic and cultural relationships. I draw upon both biological and cultural analyses, as well as those stemming from phenomenology and cognitive neuroscience. These theorists form the analytical scaffolding for the rest of the work in conjunction with the grounded theory of Dharmakīrti's approach to *pramāṇa*.

Chapter 2 introduces the context for my Tibetan medical studies, including brief descriptions of the two ethnographic sites: Dharamsala and Xining. Then it presents several ethnographic vignettes that show embodied knowledge in action for diagnosis. I introduce the heart of this chapter with my first encounter with Tibetan medicine and my first experience—as a patient—with its diagnostics. The chapter describes a condition I had that could not be diagnosed in Western medicine, which persisted with significant pain and discomfort for years, and which Tibetan medicine clearly diagnosed and treated. The chapter briefly describes the mechanics of the diagnosis and when, years later, I observed diagnostics as a medical student during my training.

These vignettes illustrate the integral role of embodied knowledge in Tibetan medical diagnosis, and several of the related strengths, namely, early detection, identifying degree of condition severity and prognosis trajectory, and the use of multiple systems to track myriad internal and external causes for whole person diagnostics. This chapter shows that embodied knowledge in Tibetan medical diagnosis is fundamentally biocultural in its methods and diagnostic data obtained. This chapter then examines some

of the weaknesses of embodied knowledge for Tibetan medical diagnostics: its lack of physiological detail, resolution and precision and its inability to have rigorous standardization. It also describes the integration of Western medical diagnostics into Tibetan medical practice and the lack of contradiction in using integrated (Western-Tibetan) methods from the tradition's perspective.

Chapter 3 describes my experience of preparing for and taking the entrance exam to Men-Tsee-Khang Tibetan Medical College in Dharamsala. It then describes the preliminary year of study that prepared my class for our formal entrance into Tibetan medical college and curriculum, and my introduction to memorizing our medical text. Memorization became the foundational pedagogical tool for our next four years of education and is one of my main areas of analysis in how embodied knowledge gets cultivated in Tibetan medicine. I describe my entrance into the medical college and first experiences as a formal student. I look at a few particular class experiences, and the theoretical foundations for how embodied knowledge is entrained, drawing from the medical text of what knowledge gets literally *in*corporated.

Chapter 4 discusses the neuroscience and cognitive science of memory, metaphor, grounded cognition, and simulation and how these areas of research illuminate understanding the processes underpinning Tibetan medical pedagogy and the cultivation of embodied knowledge. I discuss how the modes of implicit and explicit memory development as well as enacted cognition demonstrate a biocultural perspective on cultivating embodied knowledge. I integrate historical and cross-cultural examples of similar techniques, such as the method of loci.

Chapter 5 introduces Buddhist logic as studied at Men-Tsee-Khang and at Sorig Loling, where the classes expounded the idea that Buddhist philosophy is the theoretical ground for Tibetan medicine in so far as it speaks in and through Tibetan medicine. I describe the basic lessons we had on Abhidharma, categorical reasoning and *pramāṇa* theory and the related theoretical concepts that lay the foundation for later chapters on describing the view of the body, mind, health and illness as objects for diagnosis. I show how the body is taken more seriously in Tibetan medicine than in "Inner Science,"[24] or Buddhist philosophy, with nuanced insights into the body-mind complex. Buddhist philosophy tends to focus on mind exclusively with occasional reference to the body or that which comprises the body vis-à-vis mental aspects. However, Buddhist logic itself investigates both mind and body with the same system of investigation. I describe our Buddhist logic classes and the technique of debate to inculcate the logical insights. I discuss how the theoretical infrastructure of the Buddhist logic class and the related practices provide insight into the value of embodied knowledge in diagnosis, and its primary role in Tibetan medical practice.

In this chapter, I also describe how diagnosis draws from this scholarship and practice on valid cognition, valid evidence and instrumentality in *pramāṇa* theory. In this context, perception is valued over inference, yet inference is critical for Tibetan medical diagnostics and is valued over other objective means of instrumentality like diagnostic technologies in Western medicine. I revisit the benefits and drawbacks of embodied knowledge, highlighting the aspect of training in cultivating the instrument as the

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[24] ནང་དོན་རིག་པ།

physician herself. The theory of this section will be presented through the conversations I had with my main Buddhist logic teacher, Dr. Tsering Namjial, and engagements with the text from which he teaches as written by his teacher, Dr. Tamdrin Gyal. In explaining the theory, I will look at the sensory entrainment process through how the senses are understood, developing *pramāṇic* bases and assessing valid evidence —all three of which were elaborated on during our medical education and provide the epistemological foundations for understanding embodied knowledge in Tibetan medicine and its role in diagnosis.

Chapter 6 details how Tibetan doctors diagnose, putting embodied knowledge to use. I describe my experiences in my classes on diagnosis both in Men-Tsee-Khang and Sorig Loling. I look at the pedagogical shifts in the transition from exclusive coursework to integrating more clinical experience in my daily routine when I moved to attend Sorig Loling in Xining and did morning rounds with the gastroenterology department at the Tibetan Medical Hospital. I describe what my mentors diagnosed and how they did it with particular attention to examples of cases from gastroenterology — peptic ulcers, arthritis, and cancer. I describe the dynamics between memorizing the text, learning theory in class, and enacting diagnostics in practice. I look at the concept of balance, and the role of context – both karmic and physical (season, time of day, lunar cycles, environmental shifts). I describe the benefit of not knowing the Amdo dialect well when I first arrived so as to focus on the diagnostics of the body without knowing much about what the patient was describing as primary symptoms.

Chapter 7 describes how methods of becoming a Tibetan doctor provide a means of transformation of the senses, mind and perceptual faculties such that such methods are simultaneously methods of diagnosis in developing the physician as embodied diagnostic tool. In this sense, "methods of becoming" are "methods of diagnosis." I present the conceptualization of and training directives provided by the "Activities and Qualities of the Physician" chapter, which is the concluding chapter of the *Explanatory Transmission*. I use this chapter to look at the spectrum of exemplars of expertise from the mundane to the supramundane, and how such formulations of expertise shapes training processes. This chapter examines the experience of memorization as a tool in training focused concentration (*shamatha*, calm-abiding) and insight (*vipassana*) into specific meditative objects, such as perceiving the causal forms of reality, cultivating the four immeasurables, and developing the compassionate resolve to relieve all suffering. I describe the place of Buddhist practice in the development of the Tibetan doctor — integrated within our textual study and clinical practice, as well as engaging in particular practices such as Medicine Buddha and Yuthok Nyingthik. I broadly describe the use of empowerments, transmission and teachings through my own exposure. I also touch on the metaphor of preparing one's self as a suitable vessel to receive and enact the Tibetan medical teachings—form as proper alignment of the doctor's body, mind, and subtle channels as a mode of developing a clean, clear, fine-tuned tool for diagnosis. Self-transformation through embodiment processes create the embodied diagnostic tool. This chapter describes the mechanics of how embodied knowledge gets entrained in the body.

Relevant literature in neuroscience, cognitive science, learning and expertise are integrated into the discussion.

Chapter I
The Anthropology of Embodiment: Theoretical Foundations

Just as it is true that everything symbolizes the body, so it is equally true that the body symbolizes everything else.
— Mary Douglas, *Natural Symbols* (1970)

In order to engage the main questions of my research, I draw upon the anthropology of embodiment and other biocultural approaches to mind-body research. I apply these theoretical tools, along with grounded theory from the Tibetan tradition itself, to both understand embodiment processes in the physician as diagnostic instrument and disease processes as embodied in the patient that diagnostics engage.

The primary tools from which I draw to understand the processes of cultivating embodied knowledge for physician as diagnostic instrument include: (1) enacted cognition, (2) the processes of cultural affordances and kindling, and (3) Mauss's approach to habitus vis-à-vis body as technical object and technical means for achieving one's goal[25]. The theoretical tools I use to understand the disease processes embodied in the patient stem from: (1) the bioecocultural model of development and (2) biomarker approaches in biocultural anthropology and social ecology. I also review the anthropology of texts, orality, and verbal texts, noting the lacuna of work on oral literate traditions in anthropology, as well as little work to date on how textuality engages embodied knowledge. I will present the grounded theory I use in a later chapter. However, first it is helpful to look at some of the intellectual history of these Western concepts of and approaches to embodiment in order to situate the specific analytical tools

[25] Foucault's work on technologies of the self (Foucault 1988) is highly relevant to this work but I choose not to employ it as one of my primary analytical tools for this work.

I employ.

Historical Roots for the Anthropology of Embodiment

The historical roots in anthropology of conceptualizing embodiment and the integrated relationships among physiology, psychology, and culture occur early on with some of the first anthropologists in the field: W.H.R. Rivers (1905), Evans-Pritchard (1969), Clifford Geertz (1973), Franz Boas (1912, 1940), Margaret Mead (1935), and Ruth Benedict (1934), among others. Some of their approaches had a fraught history of racist agendas and the achievement of discriminatory eugenics. Others worked hard to counter such motives and demonstrated the tremendous variation—physiologically, psychologically, ecologically, and culturally—across and within human cultures. However, as anthropology as a field grew and specialized into subfields, inquiry into embodiment segmented into disparate approaches of biological and cultural methods. The biocultural integration characteristic of early work continued in some anthropological scholarship. However, many subfields have fragmented mind, body and culture into separate spheres and areas of inquiry. Many aspects of these western social, cultural and historical pathways merely perpetuated earlier Cartesian philosophical foundations partitioning mind and culture from body (Damasio 2005). This is seen particularly clearly in the medical institutionalization of psychiatry as focused exclusively on caring for the mind and rehabilitating cultural dissociations as opposed to all other medical divisions

which focus care on the body, segregating the very institutions of body from mind[26].

Despite a larger societal artifact of this dissociation and limited cross-cultural analysis, critical theorists and anthropologists have contributed valuable insights to the co-constitutive relationships of mind, body and culture. These individuals (Marx and Engels 1846; Benjamin 1933; Merleau-Ponty 1962; Latour 1999; M. Thompson 1967; Bourdieu 1977, 1992; Foucault 1973, 1975, 1988; De Certeau 1984; Butler 1993; Hacking 1986; Sontag 2001; Kuriyama 2002) from various disciplines have integrally shaped how anthropologists approach the body, mind and context (Scheper−Hughes & Lock 1987). The dialectical relationship of these other fields with anthropology provides a distinctive opportunity to engage a knowledge system in which mind and body were never segregated but seen as intertwined in mutually influential and co-constituted relationships, such as in Tibetan medicine.

The concept of embodiment in anthropology and among critical theorists has had a long history that has largely mirrored the development of numerous subdisciplines within anthropology, including medical and psychological anthropology, as well as followed trends in the fields of philosophy, sociology, human biology and neuroscience. Because work on the body is done in such a wide variety of disciplines, embodiment can be characterized by various trajectories with varying extents and approaches to addressing mind, body and influences on both from the surrounding context. The conceptualization and understanding of the interrelationships among mind, body and

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[26] Although the roots of psychiatry integrated mind and body approaches (e.g., Battie, Pinel, Freud, Adler, Jung), and contemporary therapeutic alliances (Meissner 1992) aim to overcome institutional silos to provide collaborative healthcare teams across specialties and among providers, patients and their families (Muran & Barber 2010; Arnow & Steidtmann 2014), there is still a persistent bifurcation of the institutions and resources caring for mind and caring for body. Also see for instance, Konner 1987:156-166.

context provide various structures to understanding the process of embodiment.

In my work, investigating the processes of embodiment that create the Tibetan physician as diagnostic tool draws upon modes of embodiment that engage intentionality, psychophysical transformation, and deployment of embodied knowledge to gain knowledge of the body of another. This is an application of embodiment that has not been investigated in anthropology to date. As such, there are lacuna in the literature to which this work aims to contribute.

Here, I will briefly review several of the trajectories in conceptualizing embodiment within anthropology and critical theory relevant to the current work. In the following chapters, I will expand further on how the various approaches relate to the Tibetan medicine pedagogical context—both contributing to as well as distinct from understanding the processes critical to embodied knowledge for diagnosis in Tibetan medicine, and how such approaches track sources of human difference in illness and health that have relevance beyond Tibetan medicine.

Body & Embodiment: A Brief History of Ideas

Charles Darwin's work on *The Expression of the Emotions in Man and Animal* (1873) demonstrates an early integrated approach of physiology, psychology and context, yet steers clear of the subjective, phenomenological, lived experiential perspective. Theorists such as Friedrich Engels (1975), Robert Hertz (1960), and Walter Benjamin (1933) took a similar integrated approach to Darwin, looking at the psychological as inscribed from and on the biological, and the implications for social, ecological and

political life.

Durkheim (1912), on the other hand, was interested in the social life of the body. Durkheim made a distinction between the "universal physical body" and the "higher morally imbued socialized body" (Lock & Farquhar 2007:20). Durkheim provides useful models to think with in the Tibetan medical context since the "body" in Tibetan medicine is seen as interdependent with the various bodies, objects, environments, social relations, causes, and conditions in which it is enmeshed. Likewise, the way Tibetan medicine traces illness through its etiologies includes these layers of Durkheimian social bodies. Types of embodiment, thus, could be understood as acting upon different bodies: an individual corporeal body, a social "incorporated" body enacted through social processes, and a "body politic" as an artifact of social and political control.[27]

As student to Durkheim, Mary Douglas continued the tradition of the body's role in social life and described the social and physiological levels of experience through which social systems influence the individual, and described the experience of "two bodies," the physical and the social (Douglas 1970). She used the concept of "group" and the concept of "grid" to show how interrelated experiences of one's social position as inside or outside a given bounded social group relates to how clearly an individual's social role is within networks of responsibilities, obligations, privileges and claims.

In *The Anthropology of the Body* (1977), John Blacking continued with Douglas's conception of bodies to provide four premises of embodiment: (1) both bodies mutually influence each other, and the social body is "not merely *like* a single organism: it is a

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[27] The body politic was developed in depth later by Foucault's work (1973, 1975, 1979, 1980a) as well as on body analysis by Scheper-Hughes and Lock (1987).

biological phenomenon, a product of the evolutionary process" (1977:8); (2) all humans possess a "common repertoire of somatic states, altered states of consciousness, and properties of cognitive function"; (3) non-verbal communication is fundamental and should be considered a meeting place between micro-level human movements (proxemics and kinesics) and macro-level group demographic processes and populations genetics; and (4) mind cannot be separated from body and inquiry should acknowledge the "ownership of our senses" (Csordas 1999:177).

Early work on embodiment via the natural, lived body as active and intentional, creating and responding to social and cultural life spheres, is seen in Marcel Mauss's seminal 1934 essay "Techniques of the Body" (1973a). As a student of Durkheim's as well, Mauss similarly characterized a social body but was much more interested in how it sculpts and affects the lived experience of the individual body. Distinct from Durkheim's approach, Mauss looks at the body as the "first and most natural" tool, referring to both the body as a technical object and technical means for achieving one's goal (Mauss 1973b:56). Mauss explored both the use of the body and the modes in which the body was used for social order and structure. He described the way in which, through our bodies, we participate in the "physio-psycho-sociological assemblages of series of actions" and the way internalized body behavior becomes part of the *habitus* of each individual. He noted the "profound biological echoes and effects" of body praxis (1973b: 62).

Bourdieu (1977) picked up where Mauss left off in body praxis as a main source of knowledge. For Bourdieu (1992:73), the synergy between body and experience seemed

readily accessible: “The body believes in what it plays at: it weeps if it mimes grief. It does not represent what it performs, it does not memorize the past, it enacts the past, bringing it back to life. What is ‘learned by body’ is not something that one has, like knowledge that can be brandished, but something that one is.”

Bourdieu speaks directly to the shaping of physician as embodied diagnostic tool. He foreshadows the role of memory, metaphor, visualization and the shaping of mind and body through systematic gaining of praxis knowledge. He also sets the stage for an entire movement in cognitive science of enacted mind, discussed in more detail below. In short, he argues that knowledge is inseparable from the body in and through which it affects — similar to what Mauss contends: the body is the instrument of achieving one’s aims. Knowledge is nothing without the body to affect. Though Bourdieu does not describe biological processes, his theory is synchronous with such understandings of the synergy in physiology, psychology and context.

Clifford Geertz approached the body as a medium upon which culture is inscribed, that is, “the body as text” (Geertz 1973). In this sense, the body conveys its habituations of culture such that “reading the body” is an act of reading culture (Geertz 1973). Distinct from both Mauss and Bourdieu, however, is his notion of culture. For Geertz, culture is “a system of inherited conceptions expressed in symbolic forms by means of which men communicate, perpetuate, and develop their knowledge about and attitudes toward life” (Geertz 1973:89). Bourdieu and Mauss approach embodiment as the imprinting of the body through experience, structure, social orders, and context. For Geertz, culture is a system of interwoven symbolic forms. This system of forms is equally

woven into the body such that one can simply read culture from the body just as one reads culture from a text.

However, Geertz's 'semiotic' concept of culture did not incorporate the biological. In describing his concept of culture, he says: "Believing, with Max Weber, that man is an animal suspended in webs of significance he himself has spun, I take culture to be those webs, and the analysis of it to be therefore not an experimental science in search of law but an interpretative one in search of meaning. It is explication I am after, construing social expression on their surface enigmatical" (Geertz 1973:5). Taking Geertz's approach to culture one step further to look at how such cultural inscriptions on the body affect biology, and how specific biologies affect the possible affordances of cultural manifestations, we arrive at the contemporary approaches to embodiment used today.

Although work related to embodiment well-preceded late 20th century scholarship, the term itself was initially introduced in anthropology to address the body as cultural phenomenon and as the basis of experience, largely setting aside the biological dimensions (Csordas 1990; Worthman 2009:283). Later embodiment was applied in social epidemiology to bridge the concept of society and body interdynamics (Krieger 1994). Thereafter, it has figured centrally in linking social inequalities and health disparities (Krieger & Davey Smith 2004). In the early 21st century, the expanded view of embodiment provided a foundation in which well-established lines of inquiry in human biology and biocultural research could relate cultural ecology to human development, function and health (Adair et al 2001; McGarvey 2007; DeCaro & Worthman 2008; Worthman & Costello 2009)

Multiple Bodies, Multiple Biologies

Early work in the humanities and social sciences drew upon notions of the body as a "naturally," bounded biological entity, what Margaret Lock and Judith Farquhar have termed "the body proper" (2007:4). However, in each of their own work Lock and Farquhar have taken the concept of "bodies" and embodiment to extend into further domains. For example, Lock and Scheper-Hughes (1987) continued Douglas's conceptualization of "two bodies" and proposed "three bodies": the individual lived body, the social body as symbol of nature, society and culture, and the body politic via the regulation and control of bodies. Their account provided critical analytic tools with which to think through the body and look at multiple levels of tracking illness and health—the first in the trajectory thus far to incorporate conceptualizations of health outside the "naturalized" medical body of the biological sciences. However, their individual body seemed to lack the incorporation of the physiological and psychological processes and experiences of earlier approaches. The proliferation of "bodies" as analytical tools (cf., O'Neill 2004) has proved a useful theoretical advance for the anthropology of the body and ideas of embodiment, but had to wait almost a decade before more of the biological and physiological levels of the body could be understood through this theoretical lens.

The concept of local biologies (Lock & Nguyen 2010) contributed this tool of seeing multiple bodies on the biological and physiological level. It provided significant insight into embodiment conceptualizations and the tracking of human difference in illness and healing. Though many clinicians work from the understanding that each

individual body is different, broader research has not done so and often cannot appropriately inform clinical practice. Local biologies can offer an organizing principle upon which the constitutive processes—-developmental, ecological, social, genetic, epigenetic, and mental—by which bodies are created is applied to understandings of health differentials, life history trajectories and so forth (Kuzawa & Sweet 2009; Hrushka 2009; Worthman & Costello 2009; Worthman 2010; Kuzawa & Thayer 2011; Kuzawa & Bragg 2012). Such a paradigm can help unravel the practice of applying research findings on upper class, Caucasian western bodies to understandings of and care for bodies all over the globe, or assuming medical devices work identically in all bodies — both, cases of assuming there is a "universal body" (Scheper-Hughes & Lock 1987). The concept of embodiment relating cultural ecology to human development, function and health has already challenged apparent universality in human biology fundamentals by highlighting the widespread evidence of variation—demonstrating regulation and function have particulars related to localized, cultural ecological conditions (Worthman 1999b; Worthman & Costello 2009).

Mind-Body-Culture Nexus

The social medicine group at Harvard led by Arthur Kleinman has taken a different approach in looking at how mind, body and culture operate in a clinical setting to produce further important insights into how embodiment may be conceptualized and human variation in health and illness tracked. Kleinman's early work in Taiwan (Kleinman 1978, 1980) looked at the embodiment experienced in a type of emotional

distress that he characterized as somatization. Byron Good (1994) brought in a critical phenomenology of illness experience and the role of narrative, semantic illness networks and rationality to understandings of how Western medicine approaches health and illness and its various blindspots. This work contributed to understanding how language and certain naturalized truths become grounded in body experience.

Lawrence Kirmayer (1988, 1998) continued much of this work to consider the physiological side of transformative meaning and narrative. This complemented previous work that Csordas has characterized as approaching embodiment as an "existential condition in which the body is the subjective source or intersubjective ground of experience" (Csordas 1999:181), and generated greater understanding of how healing works on multiple physiological, psychological and social-cultural levels. The body was explored as "social skin" (T. Turner 1980) and for the rich social and cultural symbolism the body may enact (V. Turner 1967). In many ways, this approach echoed Geertz's early work mentioned above in looking at "the inscription of culture on the body," (Geertz 1973), but furthered the integration of symbolism and meaning in understandings of illness and healing (Lévi-Strauss 1963; Csordas 1990, 1997). Here, somatization provides an expression on the body of eustress and distress (Konner 2010:540) of the mind and related conceptions of self, social, cultural, and structural meanings (Kohrt et al. 2004). Embodiment, in this conceptual framework, relies on the interplay between meaning, narrative, social symbolism and the affected world. In *The Body Multiple* (2002), Annemarie Mol shows multiplicity in which "bodies" are experienced through sobjective-objective lenses and looking at the co-constitutive process of meaning-making,

narrative and somatic experience. We see cultural theory beginning to revisit levels of physiology and psychology that were left out of earlier scholarship.

Cultural Affordances, Cultural Kindling

Kirmayer has furthered the integration of physiology, psychology and culture with his most recent work on "cultural affordances," the sensitivities and proclivities a given population inculcates in body and mind through various cultural processes (Ramstead, Vessière, & Kirmayer 2016). In the Tibetan medical example, one can see cultural affordances at play when a physician trains his tactile perception to decipher meaning in the pace, thickness, depth, viscosity, and rich characteristics in a patient's pulse. Tibetan cultural knowledge provides an affordance that one can gain more information than simple heart rate from taking the pulse of a patient. It also provides an affordance that one can train one's tactile sense to enhance perceptual resolution. The material affordance exists as the physicality of the physician with fingers to take pulse and a patient with a web of pulsating blood vessels to make the act possible. And the conventional affordance exists that the patient expects the physician to take her pulse, and to derive diagnostically meaningful information from that act. Kirmayer and his colleagues use the approach of cultural affordances to "understand how culture and context shape human behavior and experience by integrating several related approaches in the study of the embodied, cognitive, and affective substrates of action and the sociocultural scaffolding of embodied experience" (2016:1). As Kirmayer states, "Human biology is cultural biology; culture has roots in human biological capacities. The affordances with which human beings

engage are cultural affordances" (2016:2). For example, lactose persistence is a biological adaptation to the consumption of nonhuman milk and dairy products beyond infancy. In turn, such persistence *permits* dairying practices. Such consumption practices create local cultures around dairy production that are population- and culturally-specific. Conventional affordances are again changing these practices as global commodities and ideas about "good" nutrition and food as status symbol influences culturally-specific practices.

Franz Boas's observation when doing fieldwork among the Inuit that they have extensive vocabularies associated with ice (Boas 1911) demonstrates how the environmental context drives the linguistic vocabulary as well as the perceptual acuity to differentiate typologies of ice and the cultural practices associated with engaging them. Human biology is cultural biology and vice versa. In my work, I show that specific epistemologies and ontologies in a cultural model drive the perceptual capacities of doctors to engage models of health and illness. That is, cultural lenses engage specific biological lenses. Biological capacities dialogue with cultural affordances, and vice versa.

Luhrmann and Cassiniti (2014) integrate a similar approach to Kirmayer with "cultural kindling" in their analysis of the comparative phenomenology of spiritual experience—the affordances of body and mind "kindle" to have certain spiritual experiences and manifestations. The "kindling" hypothesis was first articulated by Emil Kraepelin (1921) in the context of how demoralizing events—a job loss, a breakup, a bad relationship—play a role in the first episode of depression and less so in subsequent ones. Kenneth Kendler and colleagues describe this phenomenon as "increased reliance on

these patterns of processing [which] makes it easier for their future activation to be achieved on the basis of increasingly minimal cues" (Kendler, Thornton, and Gardner 2000:1243; Segal et al. 1996; Monroe & Harkness 2005). Cassiniti and Luhrmann suggest that phenomenological experience is "always the result of the interaction between expectation, cultural invitation, spiritual practice, and bodily responsiveness" (2014:S341).

There is a family of theoretical tools related to cultural affordances and cultural kindling. Cultural kindling has some similarity to what Ian Hacking calls "looping" (1995), which he applies primarily to the modes in which we assign properties to certain classifications and thereby perpetuate the very classifications we created. Seligman and Kirmayer (2008) apply this concept to the body responding to certain conceptualizations through biology affect, called "bio-looping," such as a mental awareness of being diagnosed with depression resulting in altered serotonin uptakes. What Csordas (1993) calls "somatic modes of attention" are the "culturally elaborated ways of attending to and with one's body in surroundings that include the embodied presence of others." In the context of healing, this dialectic between perceptual experience and cultural practice and patterns mobilizes felt self-transformation in such contexts. Cultural kindling builds on somatic modes of attention by expanding the realms of experience to all contexts and the inputs to all senses, as well as biological shifts. Cultural affordances has resonances with what Shore (1996) calls the "cultural dimensions of personal experience" and Desjarlais and Throop (2011) call "modes of existence." Cognitive science takes the cultural dimensions and affordances of personal

experience as a foundational principle (Neisser 1976; Cassiniti & Luhrmann 2014: S341).

Robert Levy (1984) also provides helpful terms for the physical-cognitive spectrum of emotion and how culture can emphasize one end of the spectrum or another as some symptoms may be "hypercognized," while others (joint pains) may be "hypocognized." For example, Americans may experience sadness as primarily lowered mental affect—a depressed emotion—with little regard to how their body is experiencing the state. This would be an example of hypercognized symptoms since body experiences would be undervalued, lack meaning, or ignored. Whereas Taiwanese may hypocognize sadness and focus primarily on their physical symptoms such as fatigue, weakness, heart palpitations and lack of appetite.

Since affective and physical symptoms jointly manifest in almost any illness category in Tibetan medicine, such embodiment understandings in psychological anthropology are useful to understand Tibetan medical diagnostics and what the physician is trained to ascertain in his patient. As Cassiniti and Luhrmann describe, "A phenomenological experience is an interaction between cultural invitation and bodily physiology" where 'cultural invitation" is the "implicit and explicit ways in which a local social world gives significance and meaning to sensation, whether mental or bodily and the behavioral practices […] that may affect sensation" (2014:S341-2). They gloss 'bodily physiology' as the "array of genetic and individual historical actors that shape the body's responsiveness" (ibid).

Trajectories within phenomenology focused on body experience through

perception (Merleau-Ponty 1962), praxis (Bourdieu 1977), and the everyday (De Certeau 1984). Anthropologists incorporated such approaches to look at embodiment as body experience through the senses (Desjarlais 1992, 2003), practice theory (Sahlins 1978; Ortner 1984, 2005), and daily experience (Jackson 1983; Taussig 1994). These approaches with body as lived and experienced have been connected with the work on body as symbol and social skin, body as enacting meaning and metaphor, and body praxis and sensibilities to contribute understandings of human variation in how illness and healing are experienced, approached, cultivated and lived. Embodiment through such rich subjectivities has allowed insight into human variation in multivalent experiences such as pain (Kleinman 1988; Good et al. 1994) and disability (Biehl 2005).

Scholarship on embodiment has involved differing degrees of integration, relationship and relativity (Mauss 1973a; Durkheim 1912; Geertz 1973; Lévi-Strauss 1963; Bourdieu 1977; B. S. Turner 1984; Jackson 1983; Scheper−Hughes & Lock 1987; Lambek & Strathern 1998a; Csordas 1990, 1995; Lock & Farquhar 2007; Ozawa-de Silva 2002a, 2010; Ozawa-de Silva & Ozawa-de Silva 2011; Mol 2002; Mahmood 2005), and have interplayed between embodied experience and mindful bodies (Csordas 1990; Jackson 1983; Scheper−Hughes & Lock 1987; Mahmood 2005) and embodied minds, visualization and imagination (Barsalou 2008; Lakoff & Johnson 2003; Strauss & Quinn 1998; Shore 1996; Hutchins 1996; Lera 2000; Casasanto & Boroditsky 2008; Varela, Thompson, & Rosch 1992; Thompson 2010). The former group of scholars may be thought of as body and mind “in body” and the latter as body and mind “in

mind" (Lambek & Strathern 1998b). Each approach has integrally influenced the other and produced a rich dialectic. In characterizing the concept of embodiment, the physiology for such theorists focuses more on first-person experience of the body (Desjarlais 2003; Csordas 1997; Jackson 1983; De Certeau 1984; Taussig 1994; Butler 1993; Scheper-Hughes 2007) and manipulation of bodies (Foucault 1973; Lindenbaum and Lock 1993; Lock & Nguyen 2010; Scheper-Hughes & Wacquant 2002). Ozawa-de Silva (2002b, 2010; 2011), Kuriyama (2002), Lock (1993; 2007; 2010) and others have engaged the cultural, social and historical legacies that have caused us to approach the body and body-mind in certain ways. These analyses have also looked at how various cultural sensibilities provide new ways to look at the relationship, including spectra from which such dualities are experienced on one side to those in which the bodymind is simultaneous on the other side (Ozawa-de Silva & Ozawa-de Silva 2011; Lambek & Strathern 1998b). In efforts to track human difference in illness and health, these perspectives have proved exceptionally helpful in de-constructing the social roots of conceptions of health and healing, and how meanings become transformed—as biographical and communal narratives and affected qualities.

Understanding how social institutions engage the various bodies with which we experience the world and incorporate these relationships also provides a poignant source for illuminating human difference in illness and healing. The medicalization of different life transitions, stages and experiences (birth, death, pregnancy, adolescence, grief, structural violence, etc.) has provided insight into the variation of life experiences and conceptualizations of health and illness. Stress physiology may point towards cultural,

structural or social relations that undergird certain health outcomes and may perpetuate experiences of individual and community suffering (Kohrt et al. 2009; Blackburn & Epel 2017; Epel , Sbarra, Coan). Various "syndromes" that seem culture-bound or culture-related can illuminate the cultural, social or structural tensions that individuals and communities experience. For example, *yadargaa* in Mongolia was shown to be highly related to the extensive unemployment and loss of hope related to post-Soviet communities in Central Asia (Kohrt et al. 2004). *Nervosa* was shown as an embodiment of social, political and structural injustices in Brazil and the expression of hunger and distress from such experiences (Scheper-Hughes 2007). Internet pact suicide has been shown to be a reflection of an existential crisis primarily among young adults but affecting all ages throughout contemporary Japan that is not related to the psychopathologies attributed to suicide in the West (Ozawa-de Silva 2008, 2010).

Biological Anthropological Approaches

On the biological side, the nexus of physiology, psychology, culture and context has seemed more explicitly integrated, and research has proceeded from the common assumption that they are integrated and enmeshed. For example, life history theory (Hill & Kaplan 1999) has shown the tremendous diversity with which age-schedules and experiences of fertility, mortality and growth occur across the world. The work done in epigenetics (Kuzawa & Sweet 2009) demonstrates the influence of social relations, stigmatization and stress on fetal programming and intergenerational inheritance of life-course illness and health effects, and the degree to which cultural influences such as race,

caste and the anxiety caused by other social influences can literally become our biology (Gravlee 2009) and affect the rest of our life-course, including that of our offspring (Kuzawa and Sweet 2009). Work in regional variation of gut microbiota (Arumugam et al. 2011; Bäckhed et al. 2005) demonstrates the degree to which our environment literally inhabits our body, throughout our gastrointestinal tract, and nascent research looks at these microbes' role in our affective states, mental processes and mental health (Raison and Miller 2011). Stress physiology and allostatic load (McEwen and Wingfield 2003) has shown that maintaining stability through change, or allostasis, is a fundamental process that organisms engage in, but that chronic experiences can provide pathologic consequences. Thus, our understanding of stress response thresholds in the body provide broad opportunities for understanding human variation, particularly in how humans respond to stressors.

Within biological anthropology, as well as identified as its own subfield, psychoneuroimmunology provides powerful modes to see the integration of mind and body, and the work of embodiment. Work in immunology (McDade 2005), and more recently in psychoneuroimmunology (Haroon, Raison, & Miller 2011; Pace et al. 2009) has demonstrated the inseparability of mind, body and context. Earlier enigmas such as the placebo effect seem less confounding in light of these findings.

Approaches in Cognitive Neuroscience

Traditionally, in cognitive science, the body was considered peripheral to understanding the behavior of mind and cognition. It focused on understanding central

cognitive processing as if in abstraction from the bodily mechanisms of sensory processing and motor control on which it depends (Wilson & Foglia 2017). Empirical research on embodied cognition has exploded in the last decade (Wilson & Foglia 2017), focusing on acknowledging the features of the physical body that are integral to the range of perceptual, cognitive and motor capacities we possess and that are part and parcel to cognition.

Several areas that have contributed to understandings of embodied cognition most significantly include: metaphor,[28] enactivism, rethinking robotics,[29] ecological perception,[30] dynamics and development,[31] and phenomenology[32] (Wilson & Foglia 2017). The primary domains of research to which embodied cognition has contributed

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[28] Initiated historically by three landmark publications: Lakoff & Johnson (1980); Varela, Thompson & Rosch (1991); and Clark (1997)).

[29] Rodney Brooks (1991a, 1991b) presented a new kind of artificial intelligence that departed from representation-crunching intensive traditional views. He characterized as "intelligence without representation. With Agre and Chapman (1987) and Suchman (1987), Brooks a new view of computational intelligence in which "control was governed bottom-up by behavior and interaction with the world, rather than by plentiful and often complicated internal algorithms and representations" (Wilson & Foglia 2017). Clark (1997) furthered this paradigm with the idea that minds are not for thinking, but for doing — action in the world in real time. Instead of "walking encyclopedias" robotics shifted to "dynamic interaction between body and world" — this brought about the idea of cognition as scaffolded, embedded and extended (Wilson & Foglia 2017).

30 James Gibson's work (1979) on vision changed the idea of visual processing from solving to reconstruct a three-dimensional world from information provided to the two-dimensional image on the retina to emphasizing the role of the movement of the perceiver integrating the perceiver in a broad visually rich environment that integrates information through the ambient optic array (Wilson & Foglia 2017; Wilson 2004: Ch 7; Shapiro 2011: Ch 2).

[31] Esther Thelen and Linda Smith (1994) used dynamical systems theory to developmental psychology to better understand cognitive development. Dynamical systems theory show that novel behaviors are generated through bodily activity and that maturational processes are not hard-wired in genetic code but rely upon spontaneous limb movement and changing contexts. Thus, development can be seen as emergent and self-organizing as dependent upon decentralized, local interactions taking place in real time (Wilson & Foglia 2017).

[32] The phenomenological works of Edmund Husserl (1913, 1931), Maurice Merleau-Ponty (1945), and John-Paul Sartre (1943) focus on the idea that an understanding of the body is the foundation for understanding experience. Embodied cognition draws from this tradition in looking at the mechanisms that explain how cognition is grounded in and constrained by the bodily nature of the cognizing organism (Wislon & Foglia 2017). The phenomenological insights applied to understandings of consciousness, action and inter-subjectivity are represented by various works of Gallagher 2009; Gallagher and Zahavi 2008; Thompson 2007; Gallagher 2005; and Wheeler 2005.

comprise visual consciousness, perception, concepts, memory, other minds, and moral cognition (Wilson & Foglia 2017).

Several phenomena have driven research agendas in embodied cognitive science: the frequency of gesture in communication, and its facilitation not only for communication but language processing itself (McNeill 1992); the role of vision in guiding action, and vice versa, the role of bodily movement and related feedback that is integrated into visual processing—more so than the traditional models of vision have allowed (O'Regan and Noë 2001); the discovery of mirror neurons that fire when undertaking action as well as observing others undertaking the same actions (Rizolatti and Craighero 2004); various cognitive tasks, such as remembering, are more effectively performed by using our bodies or parts of our surroundings to off-load storage and simply the nature of cognitive processing (Donald 1991).

The classic view in cognitive neuroscience contends that there are no cognitive computations without representations and that cognition successfully functions when any device can support and manipulate symbols to solve a given problem to the system (Wilson & Foglia 2017). Therefore, a computer can be viewed as having cognition just as readily as a human. Varela, Thompson and Rosch introduced the term *inaction* to convey the idea that cognition experiences and portrays the world through mutual interactions with its own physiology, its sensorimotor circuit and the environment with which it is interacting (ibid). They couple brain-body-world structurally, building on "the classical phenomenological idea that cognitive agents bring forth a world by means of the activity of their *situated living bodies"* — thus mobilizing the metaphor of "bringing forth a

world" to describe meaningful experience (Wilson & Foglia 2017). From this view, knowledge emerges through an organism's bodily engagement with the environment, not determined by or dependent upon pre-existing situations or personal construals (Wilson & Foglia 2017). Thus, the organism's physiological features — eyes, ears, hands, legs, and capacities — determine the kinds of cognitive capacities, proclivities and potential worlds that can be experienced. Wilson and Foglia describe the enactivism perspective aptly: "cognition is a dynamic sensorimotor activity, and the world that is given and experienced is not only conditioned by the neural activity of the subject, but is essentially enacted in that it emerges through the bodily activities of the organism" (2017).

Color experience and categorization demonstrates this perspective well (Thompson, Palacios, and Varela 1992; Thompson 1995). As DiPaolo and Thompson describe, "For the enactive approach, a system is cognitive when its behavior is governed by the norm of the system's own continued existence and flourishing" (forthcoming: pg 6). This approach regards cognition as "a need to maintain an identity that is constantly facing the possibility of disintegration," not a mode of generating and managing representational states (ibid). The body, thus, is both means and end of being a cognitive system. They describe cognition as adaptive self-regulation in precarious conditions that require abstract problem solving (ibid). DiPaolo and Thompson use the example of bacterial chemotaxis (Alexandre & Zhulin 2001) to demonstrate the concept of autonomy in enactivism and explore the evolutionary implications of this basic link between life and mind in the enactivist approach:

> These behaviors are chemotaxis towards metabolic resources and away from metabolic inhibitors, inhibition of chemotaxis in the presence of abundant resources, cessation of chemotaxis to a resource due to inhibition of the metabolism of that resource, sensitivity to metabolic and behavioral history, and integration of simultaneous complex environmental 'stimuli.' (*forthcoming:* pg 7)

They note that the human body is comprised of a number of overlapping *seemingly* autonomous systems such as the nervous system and the immune system that can incorporate extra-organic elements (e.g., neural prosthetics) into their operationally closed networks of enabling processes (Di Paolo 2009; Thompson and Stapleton 2009).

To demonstrate the concept of *participatory sense-making*, De Jaeger and Di Paolo (2007) use autonomy applied to relational processes that take place in the encounter of two or more people. The term "autonomy" refers to a perspective about biological phenomena in that they produce the mechanisms for self-production, which are the key to both the diversity and uniqueness of life. It stems from the notion of autopoiesis (Maturana and Varela 1980, 1987), which is a systems ability to reproduce and maintain itself, whether a cell or a group of cells that make an organism (*ibid*). They describe, "The processes involved are patterns of inter corporeal coordination at various levels—imitative gestures, regulation of personal distance, posture and orientation, attunement to conversation or walking rhythms, and so on…[where] sense-making is an embodied process of active regulation of the coupling between agent and world, social interaction—through patterns of bodily coordination and breakdown—opens the

possibility of this process being shared among the interactors" (2007:493).[33] This enactive approach relates individual brain mechanisms with the development of interactive skills and interactive history (Di Paolo and De Jaeger 2012). Di Paolo and Thompson note that such an approach is particularly useful in fields like psychiatry where the social dimension in etiology, diagnosis, and intervention of disorders such as schizophrenia or autism are well known in practice, but cognitivist or neurobiological approaches have downplayed or fallen short of describing that dimension (forthcoming: pg 8). Work is just emerging that entertains explanations of mental disorders considered from a non-individualist enactive approach (e.g., de Haan and Fuchs 2010; De Jaegher 2013) by considering mutually enabling relations between individual and interactive levels (Fuchs 2012; De Jaegher & Di Paolo 2013).

Thus an enactive approach defines the "body" as a self-individuating system that is adaptively autonomous and sense-making. "Cognition" is sense-making—the adaptive regulation of states and interactions by an agent with respect to the consequences for the organism's own viability. Sense-making is impossible without a body; and even more so, sense-making is a bodily process of adaptive self-regulation making the link between body and cognition necessarily constitutive (DiPaolo & Thompson *forthcoming*). Thus, when the body and bodily senses are impaired or damaged in this model, such as someone who is blind, deaf, or paralyzed, the body shapes the type of sense-making in

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[33] They gloss that sense-making can be individual in that "someone draws our attention to an aspect of the world we have ignored" as well as joint where "a piece of work is literally created together through process that would not be possible by the individuals involved on their own" (De Jaeger and Di Paolo 2007).

which they engage. Other senses may be enhanced while others are dampened or near absent.

Some embodied cognition theorists articulate the embodiment thesis in terms of the nature of the dependence of cognition on the body as causal and physically constitutive (e.g., Shapiro 2010, 2011; A. Clark 2008; Thompson 2007; Wheeler 2005; Anderson 2003; M. Wilson 2002), whereas others use the metaphor of "grounded" to describe the context of the body in all forms of cognition (e.g., Anderson 2003; Barsalou 1999, 2008; Glenberg & Robertson 2000; Glenberg et al 2005). The distinctions are how the body *constrains* cognition, how it *distributes* cognitive processing, and how it *regulates* cognitive activity (Wilson & Foglia 2017). As DiPaolo and Thompson (forthcoming) have outlined, these various approaches to the embodiment thesis primarily differ in how the key terms, "body" and "cognition," are interpreted and how "critical" is understood.

Cognitive science has now seen increasing bodies of work on embodiment through the conceptual frameworks known as the *4Es*: cognition as embodied, embedded, extended, and enactive (Maturana & Varela 1987; Varela, Thompson, & Rosch 1991; Hutchins 1995; Kelso 1995; Nolfi & Floriano 2000; Noë 2004; Gallagher 2005; Wheeler 2005; Pfeifer & Bongard 2007; Kiverstein & Clark 2009; Menary 2010; Gallagher & Zahavi 2012; Hutto & Myin 2013; Malafouris 2013; Clark 2014; Vörös, Froese & Ziegler

2016).[34] Embodied cognition asserts that forms of cognition are realized through the bodily interactions we have with our environment and with others. For example, writing a note to remember something extends our cognition externally, as does discourse with others to better understand the solution to a problem. Sometimes our bodies respond to something before our conscious minds are aware of the response.

Embedded cognition describes how our mind is integrated into the fabric of the environment, constantly situated in a context that affords certain bodily capacities, impulses, goals, and thoughts. Embedded cognition provides an understanding of how a given context offers affordances of interaction that are directly perceived as meaningful. For example, if one has not experienced a context in which a particular exotic fruit was eaten, one might come upon that fruit and not perceive it as a food item. That same piece of fruit may be perceived as shelter for a small organism. Similarly, a body with fins and scales would be useless on a terrestrial environment and would only have the capacity to move in water.

Cognition must be relative to the organism, the situation and the purpose. This will become clearer when we discuss a similar approach to cognition by seventh century Indian Buddhist philosopher Dharmakīrti. Humans experience a specific niche in which

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[34] It is important to note that the grouping of these dimensions of understanding cognition is done so because they all reject of at least radically reconfigure traditional cognitivism. However, it is not to suggest that they are genuine compatibilities between them. For example, enactivism as promoted by Thompson and DiPaulo describes the continuity between life and mind; whereas extended functionalism abstracts away from biological details and thus seems incompatible (Menary 2010). Vörös, Froese, and Ziegler (2016) suggest that enactivism and neurophenomenology accord with pluralist accounts of science and suggest further emphasis in research. Although Ward and Stapleton (2012) agree with the enactivist claim that perception and cognition essential depend upon the cognized's interaction with their environment, and they further this understanding to accept that cognition is consequently not only essentially embodied and embedded but also that the underpinnings of cognition are inextricable from those of affect. They also accept that *the possibility of cognitive extension* depends upon the instantiation of a specific mode of skillful interrelation between cognizes and environment (89). Thus, since cognition is enactive, then it is also embodied, embedded, affective and potentially extended (ibid).

the scaffolding of sociocultural and environmental dimensions allow them to develop complex forms of thinking, expression, and other perceptual-conceptual applications. Tool-use and language are examples of this embedded quality of cognition. In order to make fire, innumerable techniques have been developed across cultures, populations and geographies. However, the Hawaiian fire saw would not be constructed or even particularly functional in the Apache desert of northern Mexico since it requires specific local resources and utilizes a niche of humidity, diurnal ambient warmth, and tinder materials to work. Likewise, a thin stalk on a piece of box elder wood from the desert would be impotent for making fire in the saturated air of Hawaii but is ideal in the American southwest. Language also draws upon contextual cues and metaphors from the cultural and socioenvironment from which it developed.

Extended cognition describes how mind extends into enculturated practices by virtue of the devices we use to compute, remember, process, and understand our world. From pen and paper to computers and smartphones, these cognitive processes are extensions of ourselves. Extended cognition demonstrates the constitutive basis of cognition in the sense that the presence of others—human, animal, living, technological or inanimate—can empower or impede our cognitive capacities, just like the environment we are in can facilitate or diminish our cognitive capacities. For example, a group working to solve a problem can gain great success if their cognitive engagements build on one another. However, a group can experience diminished cognitive capacity such that an individual may do better at solving the problem without the challenges presented by engaging in the group approach. Likewise, someone who knows their environment well

might be able to procure the resources to construct a shelter quickly and well, but in an unfamiliar environment, might run the risk of life-threatening environmental exposure.

Enactive cognition engages the previous *E's* from a particular approach. It was founded by Varela, Thompson and Rosche (1991) when they defined embodiment in terms of an organism's various sensorimotor capacities, which are embedded and engaged with wider contexts of biological, psychological and cultural varieties (Hutto & Myin 2013:4). Their view emphasizes the essential link between mentality and embodied and embedded activity. In this sense, organisms "enact" or "bring forth" their worlds—and that enaction enables a world to "show up" for individuals. Radical enactivism contends that there is no way to distinguish neural activity that is imagined to be genuinely content involving (thus, truly mental, truly cognitive) from other "non-neural activity that merely plays a supporting or enabling role in making mind and cognition possible" (Hutto & Myin 2013:12). It sees embodiment as possible only in a biological body, a living system. The living system is also unique in that it is self-producing and adaptive. The living body needs to produce its identity as the particular kind of system it is at the same time as it materially distinguishes itself from the rest of its physical environment, which it nevertheless depends upon continuously to satisfy its energetic and material exchanges of needs.

This approach provides a foundation for the embodied mind's existence, its concerns and the normative grounds which guide its adaptive regulation with its interactions with, in, and of the environment. Acting and perceiving thereby become synonymous, and both activities are realized by means of the sensorimotor loop. This

loop is a property of the organism-environment system as a whole, thereby making extended mind the default mode of mind in general rather than a specifically human case. The enactive mode of understanding embodied cognition will be a primary conceptual framework I will use in my approach to embodiment in training the physician as diagnostic tool in Tibetan medicine.

The enactive approach also integrates reflexivity in that it takes as given that we have a living body that we can experience subjectively from the inside as well as objectively from the outside. Thus, a living body can be a lived body. This allows for the enactive approach to align well with the phenomenological tradition in philosophy since it takes the first-person subjective perspective seriously and understands our intersubjectivity since our reality is a social and ecological reality.

In *How the Body Shapes the Way We Think*, Pfeiffer and Bongard (2006) describe important paradigms of embodiment. First, embodiment enables cognition and thinking. As Lakoff and Núñez (2000) argue, even mathematical thinking requires the body. Second, embodiment allows for action. For example, the morphology and material properties of the hand that are part of the neural control required for grasping allow for specific cognitions surrounding this action. Third, the physical position and arrangement of receptors and sensors on the physical body allow for a specific kind of processing of sensory stimulation. It provides the raw material, the initial engagement, for the brain to map. Fourth, the material properties of muscle-tendon-neural circuits in the periphery allow for rapid movements that the neural system would be too slow to control. Fifth, engagement with the physical environment allows for informative and correlated signals

to be generated along certain sensory channels. Thus, the very materiality—such as the elasticity of the muscle-tendon system, or the deformability of the tissue on the fingertips — takes a load off the brain (Pfeifer & Bongard 2006:20).

Psychocultural Approaches & Integration

Psychocultural research from as early on as the Whitings (Whiting & Child 1953; Whiting 1966; Whiting, Landauer, & Jones 1968; Whiting, Whiting, & Longabaugh 1979; Whiting 1977; Whiting & Edwards 1992) reflects a sophisticated and applied approach to embodiment, merging the layers of physiology, psychology, culture and ecology in the context of child development in cross-cultural research (Worthman 2010). Their understanding of the child as a "developmental project" for "a suite of cognitive, behavioral, and physical dispositions, sensitivities, predilections, and capacities […] honed through evolutionary processes" (Worthman 2010:547) allowed for the layering, sensitizing and molding of Mauss' early conceptualization of habitus (1973a) to be applied in theory and seen in praxis. Their multivariate theoretical approach necessitated their integrated methodology of standardized observations and recordings of social behavior and traditional ethnography (Konner 2010:604).

Worthman's review of the three current models in psychocultural research (developmental niche, ecocultural theory, bioecocultural microniche) all show "an absence of nature-nurture tension and seamlessly incorporate biological dimensions (adaptation, evolved design, physiology, ontogeny) as relevant to their purposes" (2010:557). The developmental niche formulated by Sara Harkness and

Charles Super (2002) expands the Whiting model, which, Carol Worthman describes in her review, views the child as "active agent vis-à-vis the niche who shapes the specific micro environment she or he inhabits and, of course, embodies the lived experience itself" (Worthman 2010:551). The ecocultural theory proposed by Tom Weisner (1996; 1997) continues to extend the model to look at daily routine, activity setting and cultural ecology. His approach set a foundation for later cultural models and logics (D'Andrade & Strauss 1992; Shore 1996). Worthman's bioecocultural microniche model (2010) extends the previous two models through integration of research in life history theory, stress and allostatic load, and cognitive science. It takes the "microniche" of the child's immediate environment and looks at "lived experience and actual operating conditions of the child *in relation to* the child's characteristics and capacities" (Worthman 2010:555). It is in the developmental microniche, as Worthman demonstrates, that "culture gets under the skin" (2010:555).

Each of these models demonstrate biological, ecological, and cultural processes as primary assemblers of "embodied habitus" in development, and consequently over the life course (Worthman 2010:557). Insights from epi/genetics, psychiatry and developmental biology have required health sciences to "bring the body back, in context" (Krieger and Davey Smith 2004:94). Worthman and Costello (2009) define embodiment as "the impact of ongoing bio-contextual dynamics on physical form, functions, and capacities" such that it is a critical tool for "tracking dynamics among differential experience, function and well-being" (283; Worthman 1999). My work is interested in how this process becomes intentional and how it is enacted *between* individuals, as with

physician and patient.

Integrated biological and cultural approaches have gained increasing attention in medical anthropology (Armelagos et al. 1992; Brown et al. 1998; Leatherman 1996; Oths 1998, 1999) and biological anthropology (Bogin 1997; Goodman and Leatherman 1998a) and remain an integral approach to inquiry in psychological anthropology (Hrushka, Lende & Worthman 2005). These scholars shed light on how efforts to maintain a theory of mind-body duality in cultural theory has proved problematic, and why the turn to subjectivity and phenomenology on the cultural side has allowed access to the lived body more readily than earlier approaches. These models allow us to understand human differences in illness and healing through the assemblage of earlier anthropological and cultural theory work on meaning-making, narratives and the conception of the self, metaphors, multiple bodies, mind-body spectrums, lived subjectivities, performativity and identity, language and grounded cognition, and so forth as they are integrated into the framework of bioecocultural processes of embodiment. Such work provides a foundation from which to understand the processes by which patients embody disease ecologies. Cerulli (2017) provides an analysis of similar processes at work for Āyurveda.

This framework also gives insight into how Tibetan doctors develop biological, sensorial, and mental imprinting to ascertain disease through physiological cues in the patient for differential diagnosis. Likewise, Tibetan medicine recognizes that the complex etiologies that coalesce to produce health or illness stem from this same web of influences. The context of ecology, the co-constitutive relationships and influences of developmental processes on physiology, psychology, and behavior, and the myriad

related processes and conditions provide a strong tracking system for understanding these etiologies and experiences of illness and health. As culture is operationalized into the lived experience of child development, the cultural-biological divide seems less apparent. However, as patterns get engrained and influences naturalized, the continuous cultural-biological dialectic is less apparent, though still in process. Understanding the processes in early life can help illuminate the role these processes play throughout the life course, the experiences they support, and the modes through which one intentionally trains in these processes.

On the cultural side, “kindling” and “affordances” provide a conceptual basis to understand the interrelations of physiology, psychology and culture to produce different manifestations of illness experiences. However, they less directly show the active process of entraining phenomenological experience to pick up those manifestations in others, say for example, as a physician would through pulse diagnosis in her patient. Likewise, on the biological side, the developmental niche, ecocultural theory, and the bioecocultural microniche show how culture gets under the skin and how specific manifestations of disease may aggregate in a certain population. However, it does not show how someone might train in understanding how to pick up those physiological cues. My work aims to add to the work on embodiment by demonstrating the biocultural processes underlying the intentional entrainment of embodied knowledge that can be implemented for diagnostics of illness in another.

Embodiment Defined

In the work, I define embodiment as a dialectical process in which cognition shapes the experiences and processes of the body and brain, and the body and senses engaging with the external and internal environment shape cognition. It includes the body's situatedness and relationship to the environment, the motor system, the perceptual system, and conceptualization. Cultural literature on embodiment encompasses the extended mind thesis, embedded and situated cognition (Dawson 2014), embodied cognition (Shapiro 2014), embodied emotions (Hufendiek 2015), enactive cognition (Varela et al 1992, 2017), language formation, and development. The biological literature includes neuroscience, neurobiology, plant cognition, language development, sensory development, neuroendocrinology and psychoneuroimmunology. Biocultural approaches define embodiment as "the impact of ongoing bio-contextual dynamics on physical form, functions and capacities," from which work on biomarkers access to investigate the question of how 'culture gets under the skin' and track dynamics among differential experience, function and well-being (Worthman 1999a; Worthman & Costello 2009:283).

On the patient as embodying disease processes side, how 'culture gets under the skin' is an integral part of how Tibetan medicine views the body vis-à-vis the psychophysical make-up of the aggregates and assumes that mental patterns, emotions, social interactions, environmental context, dietary and behavioral habits fundamentally shape the body, fundamentally change the form and function, what we might call the biology.

On the Western side, from biocultural anthropology, social epidemiology and social ecology, epi/genetics, psychoneuroimmunology, and human biology, we know that context matters in health outcomes and disparities. The last several decades of work on biomarkers has also provided us fundamental tools to track such pathways and processes of context on outcomes. Such work has also furthered our understanding of how culture informs biology and vice versa. We understand that culture informs biology through development (Super and Harkness 1999), across the life course (Dressler et al 2005), across generations (Worthman & Kuzara 2005; Weaver 2007). Similarly, in Tibetan medicine, we see how mental patterns, emotions, social interactions, environmental context, dietary and behavioral habits—what we term "culture"—affect the body through development, across the life course, and across generations. This latter aspect is also seen to affect the individual consciousness across lifetimes through the transmission of karmic imprints.

From our understanding of embodiment in biocultural anthropology, "place-specific morphology and function emerge not simply from the objective conditions of life, but also from the experience of and responses to these conditions. The meanings of an event mediate its cognitive-emotional impact, influence biological responses, and condition future responses" (Worthman & Costello 2009:283).

We see the effects of mind on biology in biocultural research — social trauma can produce acute and enduring affective physiological responses with consequences for health (Heim and Nemeroff 2001; Flinn 2006). However, the cultural context of practices, norms, hierarchies, and expected responses can modulate whether an individual

interprets or responds to their experience as traumatic (Anderson-Fye 2003). The ability to perform particular cultural norms and goals can integrally affect mental and physical health (Dressler et al 1998). These findings in the Western literature demonstrate that many of Tibetan medicine's core tenets of how mental/emotional patterns, context, socioecocultural environments affect health are readily accessible from current biocultural research. Biomarkers in the Western clinical context provide access to these processes just like Tibetan medical diagnostics do in the Tibetan clinical context. A biomarker is "a measurable feature that taps into the pathways linking a health outcome to the factors that influence it, and therefore opens a window onto the impact of such factors on that outcome" (Worthman & Costello 2009: 284). In short, biomarkers predict outcomes of an intervention (Weir & Walley 2006) or influence. Biomarkers are tools for investigating the biocultural bases for health disparities. They look at how culture informs biology and vice versa through development (Super & Harkness 1999), across the life course (Dressler et al 2005), and across generations (Worthman & Kuzara 2005; Weaver 2007). In Western medicine, they are derived from genomics, proteomics, or imaging (Woodcock & Woosley 2008). In Tibetan medicine, they are derived from observation, practical experience, and inference — the same tools from which Western medicine derives its biomarkers except the latter uses external instrumentation.

In Western applications of biomarkers, it is understood that various bodily states and functions cannot be assessed by visual inspection or interview. In Tibetan use of its biomarkers, it assumes that bodily states and functions are best assessed by perceptual cues from visual, tactile or other sensorial faculties. Both Western and Tibetan

biomarkers are understood to be necessarily imperfect. For one, outcomes—whether exposures or treatment interventions—are mediated and modulated by multiple pathways. Likewise, biomarkers are an estimate of actual physical states of physiological processes (Worthman & Costello 2009: 286). These markers are limited by invasiveness of technique to retrieve the biomarker, affordability in doing so, sampling timing and frequency in assessing the biomarker, and the limited time depth. It is easy to misunderstand a biomarker of characterizing a static state that persists through time. However, physiologies, chemistries and processes in the body are dynamic. They are constantly changing. So one must understand such a marker as simply a data point at a given point in time of these dynamic process, which will need to be sampled through time to gain an understanding of the overall processes occurring.

Tibetan diagnostics describes the marker one receives when assessing the diagnostic object[35] as the *da*[36] (translated as sign, indication, signal)—the communication of the object and pathways in which it is implicated. The term itself has a connotation of the processes in which it is embedded and its role as a mere mark of intimation of the state of those dynamic processes in that moment.

In Western scholarship, there two approaches to biomarkers: a biomedical orientation and a social and epidemiological orientation (Worthman & Costello 2009:285-286). The biomedical orientation assesses the quality of the biomarker on its ability to predict the impact of an intervention on a target clinical outcome. The social

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[35] བརྟག་བའི་ཡུལ།

[36] བརྡ།

science epidemiological orientation assesses the significance of a biomarker on its ability to demonstrate the contextual determinants of health; that is, how it mediates an exposure and its cumulative, broad-spectrum effects on function and well-being (Worthman & Costello 2009:286). The latter looks at the dynamic interplay of context and bodily states, including cognition, emotion and physiology, and how to represent the "aggregate burden or benefit of life as it is lived and experienced" (ibid). The multifactorial causes, processes and outcomes of psychosocial stress (Sapolsky 1998) and its mediating markers of these complex influences is an illustrative example. Tibetan medical diagnostics implement both approaches to biomarkers in its own traditional diagnostics, or perceptual biomarkers.

Psychosocial stress is a helpful example in illustrating the role of biomarkers because its physical and mental impact on individuals given identical exposures may be quite different depending on the response to such stressors. Acute and chronic stressors have been identified as modulators of HPA (hypothalamo-pituitary-adrenal) axis regulation with related effects on immune profiles and metabolic regulation (Worthman & Costello 2009:286). The sequelae of exposure to outcome to vulnerability of impact of next exposure has also been demonstrated. Effects on HPA axis, immune response and metabolic function from an initial exposure increases vulnerability to psychosocial stress and psychopathology (Heim and Nemeroff 2001; Simeon et al. 2007) as well as physical morbidities and infections (Goodkin and Visser 2000; Christian et al 2006) and chronic disease such as in metabolic disorders, autoimmune conditions, and cardiovascular disease (Gruenewald et al 2006; Taylor et al 2006; Jaffe 2013). In the case of stress, like

most conditions in Tibetan medicine, a single biomarker is insufficient to provide clear differential diagnosis or indication of the outcome. In stress physiology research, an aggregate measure of the physical burdens associated with stress coping is called allostatic load (Seeman et al 2001; McEwen and Wingfield 2003). An aggregate measure has its benefits and drawbacks. On the beneficial side, it allows for indications of exposure and predictive outcomes for a complex network of physiological processes. The predictive capacity depends on the profile of those aggregate measures (Worthman and Panter-Brick 2008) and their relationship to the outcome related to stress that one is assessing (Loucks et al 2008). For example in the Great Smoky Mountains Study, allostatic load was measured vis-à-vis anthropometrics, morphometrics, and blood spots to assess the cultural and social ecological interactions with developmental processes influencing mental health risks for children growing up under challenging socioeconomic conditions (Worthman & Costello 2009:288).

As a means of tracking relationships at the intersection of cultural ecology and social ecology on health, biomarkers provide a means to probe how beliefs, values, and practices affect capacities, function and load (Worthman & Costello 2009:287).

As Worthman and Costello (2009:289) point out, a wider biomarker array can facilitate the search for side effects and track complex processes more effectively. As such, Tibetan medicine describes this spectrum of biomarkers use in that ideally one should incorporate as many diagnostics as possible. However, with time and experience, familiarity with case-specific patterns and the general physiological processes for all disorders, one can narrow down the diagnostic markers on which one relies.

Anthropometrics and morphometrics have long been an aspect of bioanthropological approaches to assessing health determinants. They have even been used to look at mental health risk factors among adolescents (Worthman & Costello 2009). As such, we can appreciate the use of morphological assessments in Tibetan medicine to determine proclivities of certain conditions. On one side this is related to constitution. On another side this is related to how the body changes over time and its dominant influencing *nyépas*. Such biomarkers exemplify "processes of embodiment" and aid in "tracking pathways to health disparity" (Worthan & Costello 2009:292).

On the physician as diagnostic instrument side, my approach to embodiment stems from a similar approach to Fuentes' Extended Evolutionary Synthesis in which he states, "Seeing bodies and evolutionary histories as quantifiable features that can be measured separately from the human cultural experience is an erroneous approach. Seeing cultural perceptions and the human experience as disentangled from biological form and function and evolutionary history is equally misguided" (Fuentes 2016: S13). Similarly, I argue that embodiment must be understood in both directions: from the biological-ecological substrate in dialogue with the cultural-social-phenomenological layers, an inner-outer, up-down, biocultural approach. Tibetan medicine does not sever humanistic and scientific approaches, and regards contemplative practice and experience as forms of inner science. In many ways, it takes *a priori* the assumption that human experience is a "system of entangled agents and processes," and that all experience for

any sentient being is a vast web of interdependencies that are difficult to track and form complex lattices of causes and conditions for any given event or experience.

Embodiment, like any developmental or evolutionary process, has various inheritance systems: genetic, epigenetic, behavioral, and symbolic (Fuentes 2016:S16). Genetic systems provide the biological substrate on which experiences reside. Epigenetic processes allow for the engagement of that biological substrate and enactment — the patterning and deploying or silencing of molecular processes, enzymatic actions, protein activity and developmental sequences which affect the developmental and physiological trajectories and processes resultant from causal systems related to DNA/RNA infrastructure and relationships. Behavioral process encompass the actions, patterns and particulars that are transmitted horizontally within generations and vertically across generations.

Transmission in the Tibetan medical context also integrally relates to lineage: teacher-student relationships that transmit embodied knowledge across time and generations of practitioners and within a given time among students of a given teacher. Symbolic inheritance also provides another form of transmission in terms of symbolic concepts, ideologies and perceptions, which can also transmit across generations and within generations. In the Tibetan medical context, symbolic inheritance can also transmit across lineages through means of textual engagement and sharing and interacting with the socio-cultural-biological context that brings those texts and its meaning to life. I call this "symbolic enactment" for a given time and space. Here, we see Tibetan medicine transforming in meaning and implication as practitioners deploy the medicine with

different populations, cultures, diseases, biologies, environments and geographies over time.

Tomasello and colleagues (1993) describe cultural learning as requiring three forms during human ontogeny: imitative learning, instructed learning, and collaborative learning, in that order. However, we also see such domains of learning extend across the lifetime. The fidelity of transmission of behaviors and information across conspecifics is unique to the human species (Tomasello et al. 1993). I argue that different cultures and populations have developed techniques that increase the fidelity with which behaviors and information is transmitted. Embodied knowledge, particularly, requires a synthesis among imitation, perceptual-attentional skill, and an accessible knowledge base—either in oral or written form.

As Margaret Lock wrote, "Individual bodies are not mere containers stuffed with biological entities that age and die over a lifetime; rather, they are products of human evolution; the *longue durée* of history; environments expansive and local; the communities that people live in; the diets they eat; the toxins, insults and abuses they are exposed to; and the good times too" (2015:171-172). Bourdieu's (1977, 1990) conceptualization of habitus and the framing of "structured structures predisposed to function as structuring structures" (1990:53) depicts the patterning of embodiment for Tibetan doctors. The biological substrate of a physician's body is layered with developmental and physiological processes that are patterned over a lifetime, the conceptual and experiential frameworks that are entrained, and the co-constituted reality of evolution in social communities. It is also affected by the diet one ingests, the

behaviors one integrates, the environments one experiences and patterns one imbibes, the cleanliness of one's body and mind in providing the physician with the quality of attention to attend to one's patient. Because the body responds to patterns, one also apprehends patterns viscerally through one's senses. This is embodied knowledge. The pulses that dictate exposure to excess heat in the body, that relate to an infection or trauma, the characteristic slow dissipation of bubbles in stirred urine that demonstrate low digestive heat and poor metabolic function, and the habitus and physique that indicates a dormant illness robbing a patient of his radiance — these are all embodied ways of knowing.

Oral Traditions and Embodiment

Part of the equation for Tibetan medical development of embodied knowledge is the work of an oral literate tradition that imbibes knowledge through memorization and recitation of a written text and relies upon oral instruction for understanding, clarification, and detailed instruction. However, the relationship between oral traditions and embodiment has not been investigated. Likewise, much of anthropological work done on oral traditions has focused on those traditions that are illiterate—such as Boas' work on oral traditions among Pacific Northwest tribes (Boas 1914). The collection and interpretation of indigenous texts as Native American ethnography was a major part of the development of American cultural anthropology as distinct from the structural-functionalism characteristic of early British social anthropology (Barber 2008:14). However, even Malinowski made a collection of "ethnographic statements, characteristic

narratives, typical utterances, items of folk-lore and magical formulae" (Malinowski 1984 [1922]:24).

Bakhtin has also had a central influence on anthropology in his approach to textuality. He says, "If the word 'text' is understood in the broad sense—as any coherent complex of signs—then even the study of art (the study of music, the theory and history of fine arts) deals with texts (works of art). Thoughts about thoughts, experiences of experiences, words about words, and texts about texts. Herein lies the basic distinction between our disciplines (human sciences) and the natural ones (about nature)" (Bakhtin 1986[2010]:103). Linguistic anthropologist W.F. Hanks followed Bakhtin's lead to use "text" to designate "any configuration of signs that is coherently interpretable by some community of users" (1989:95), noting that it is not reserved for written or printed words but treats all oral configurations of words as well as visual images and musical sounds.

Yet very little work has been done in anthropology on literate traditions that employ oral techniques of memorization and knowledge transmission, and particularly how that knowledge is being incorporated into embodied practices. What work has been done on oral transmission within literate traditions began with Milman Perry on the Homeric epics during the 1920s. Scholars who have contributed work on oral and oral literate traditions include John Foley, Buddhist studies scholar Donald Lopez, and anthropologists Jack Goody and Walter Ong.

The hubris and prejudice against oral traditions is exemplified by Walter Ong's list of nine characteristics of oral culture (Ong 1982) that reduce oral traditions to

experiential and un-analytic subordinates to literate traditions[37]. Anthropologist Jack Goody (1987) describes the Vedas as a written tradition transmitted orally (Goody 1987: 115). However, Lopez and others refute this claim and assert the oral origin of the Vedas:

> The four Saṃhitās are generally thought to have reached their present form by 1000 BCE. The possession of writing by foreign traders may have been known at the time of the Buddha in northwest India, where its use was limited to commercial matters. The perspective of its alien and hence polluting nature is evidenced in the *Aitareya Āraṇyaka* (5.5.3) which states that the disciple, 'should not learn [i.e., recite the Veda] when he has eaten flesh, or seen blood, or a dead body, or done what is unlawful, …or had intercourse or written, or obliterated writing.' The earliest archaeological evidence of writing in India in an Indian language, after the still undeciphered Harappan seals, are the inscriptions of the rock edicts of Aśoka in Brahmī script, dated circa 258 BCE. The Greek ambassador Megaphones found no evidence of writing among his hosts at the Maurya court in Patna around 300BCE. Although Indologists continue to debate how long before Aśoka the Brahmī script was developed, there is general consensus that the Vedas, long revered as

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[37] Ong lists the nine characteristics as: the first three on orality: (1) The works of oral cultures are addictive rather than subordinative in that they are marked by pragmatics, such as simple grammatical constructions linked by identical conjunctions, whereas written structures place greater emphasis on the organization of the discourse itself without concern for the needs of the speaker, employing subordinate clauses rather than conjunctions. (2) The works of oral societies tend to be aggregative rather than analytic, employing a variety of mnemonic aids such as epithets, formulae, and stock phrases, often lacking the sense of individual words as discrete units. (3) Such works are highly redundant, repeating what has been said in order to allow the often distracted listener to follow the narrative. The next six on oral societies: (4) they are conservative or traditionalist, in that they inhibit intellectual experimentation and speculation. (5) They conceptualize knowledge, in his phrase, "close to the human lifeworld," in that the lack elaborate analytic categories that would structure knowledge apart from lived experience. And as Donald Lopez notes, "in a statement that should set of an alarm in the brain of any student of Buddhism," Ong declares, "An oral culture has no vehicle so neutral as a list." Instead, literate cultures devise lists, outside the context of human action. (6) The works of oral cultures are agonistically toned, marked by exaggerated vituperation and extravagant praise and descriptions of what otherwise might be termed graphic violence, thereby situating knowledge within a context of struggle. Writing, on the other hand, "fosters abstractions that disengage knowledge from the arena where human beings struggle with one another." (7) Orality is empathetic and participatory, bringing about a close communal identification with the known. (8) It is homeostatic in that it remains concerned with the present, allowing memories of what has been irrelevant to fade from communal consciousness. (9) Finally, it is situational rather than abstract, unavoidably using concepts but again within situational frames of reference which are 'minimally abstract.' Lopez notes that the last point draws from Soviet neurologist A.R. Luria, who also studied the journalist S for his vast memory capacity, when Luria was looking at Russian peasants in the 1930s and noting the lack of articulate self-analysis among illiterates because it requires "a demolition of situational thinking" (as quoted by Lopez 1995:30).

> *vāc, śabda* and *śrūti*[38], were composed orally and then preserved as sound through elaborate oral mnemotechnics, assiduously maintaining the form with little concern for the content. (Lopez 1995:33)

The idea that a tradition could maintain and cross-generationally transmit a large corpus like the Vedas exclusively orally for hundreds of years before it was ever written down is hard for many in a contemporary society that relies on written records of information themselves to maintain memory. However, there were particular eras in many of the great literate societies where this was the case. I will discuss mnemotechnics in greater detail in upcoming chapters. However, it is important to note that in Tibetan medical oral transmission, the content is as assiduously maintained and transmitted as the techniques of memory and recitation. The Vedas are also considered to have influenced the development of the knowledge base and techniques for transmission that entered Tibet in the seventh century CE to eventually become the *Four Medical Transmissions* (Zysk 1991, 1993, 2000; Martin 2007).

Furthermore, the anthropological study of oral traditions has focused on their role in demonstrating a culture's communicative systems and norms, and how these norms are "put into action" through the "practice of telling stories" (Thom 2003:3), but has not focused on the transmission of large volumes of cultural knowledge through memorization and oral recitation. Franz Boas contributed foundational work to the collection and publication of texts on oral traditions as history and culture (Thom 2003). He focused on the categories of song, narrative, poetry and prose, an ethno-poetics highlighting "meanings negotiated between tellers and audience" (Thom 2003:17,19).

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[38] Translated as "[deified] speech," "[vocalized] sound," and "that which is revealed [or heard]," the latter of which also has the connotation of a divine recording (Prakashan 1959).

Boas saw these data as important to understand the history and distribution of culture, but not as a coherent means of cultural transmission. In his studies, Boas had a hard time showing that individual oral traditions were representative of the culture as a whole. Morantz (2001) has asked "how can one presume to know the meaning of oral traditions when there is great social, temporal, cultural, and linguistic distance between teller and interpreter" (Thom 2003:15).

Tibetan medicine would argue that there has been a continuous lineage between the teller and the interpreter such that it is cohesively transmitted. In his analysis of authority and orality in the Mahāyāna, Lopez describes the notion of "an uncreated truth" in orally transmitted words that "the content remains the pristine possession of the absent Buddha" (Lopez 1995:39). The *Four Medical Transmissions* is described in the tradition as, if not actually spoken by the Buddha, then at least inspired by an emanation of the Medicine Buddha (TI, Ch1). The power of lineage is hearing from a teacher who heard from his teacher whose oral lineage traces back ultimately to the Buddha (Lopez 1995:39). Here a further emphasis of "text as key informant" arises as the text provides a living teaching directly descended from the enlightened word of the Buddha, so one should rely on the dharma, the meaning, the definitive meaning, and the knowledge it imparts (Lopez 1995: 40).

Likewise, there has been criticism about researchers trying to make sense of oral traditions that have been recorded in the last century, moving between flat historic narrations and translations of oral traditions to contemporary social contexts by comparing the kinds of meanings the traditions have held over time, where "symbolic and

structural accounts have been heavily criticized for moving too far from the intellectual lives of the people whose meanings they purport to uncover" (Thom 2003:21). However, in the Tibetan tradition, transmission has been continuous and cohesive, without historical breaks, intentionally trying to convey similar meanings and understandings across large periods of time. This oral transmission practice provides a model of cultural transmission that has yet to be fully appreciated in the anthropological literature.

Karin Barber (2008) has contributed to the anthropology of text. She describes a text as a tissue of words from the Latin *texere* meaning literally to weave, join together, plait or braid. She argues that writing is not what confers textuality. It is not exclusively the written words, but "the quality of being joined together and given a recognisable [sic] existence as a form" (2008:1). She describes the "song-stitchers" of ancient Greece who performed oral rhapsodes, "sewing together formulas to construct a remarkable, attention-worthy form" (ibid). She engages the oral text as "the *only* thing that outlasts death and time," (Barber 2008: 1) the one sacred element that testifies to pasts memories, knowledge and achievements. Barber describes how anthropology has a history of attending to the capacity verbal texts have to shed light on "the inner life of societies" (2008:2), and that older anthropology often privileged the words of such text over the other kinds of meaning-making in music, dance, gesture or the sensory, tactile, aural and visual communications used while performing these verbal texts (2008:3). She also notes the central role the study of language has had in anthropology as perhaps the most complex, exact and ambiguous system of meaning-making devised by humans. However still the orality of literate texts, the techniques used to engage them through

memorization and recitation, and how content, particularly knowledge imbued into the body, is transmitted through time with high fidelity is not addressed.

My current work aims to contribute to the anthropology of the great orally transmitted literate cultural traditions, specifically focused on body and medical knowledge, to show that when an oral tradition is combined with a literary tradition in which the exact words are memorized, recited and passed on, it cohesively and effectively transmits the knowledge corpus to larger groups of people for specialized embodied knowledge.

Chapter conclusion

From presenting the historical development of scholarship on embodiment, we can see many analytical frameworks are relevant to the main questions of my research. However, primary to these theoretical tools, I look at those most illuminative to the processes of cultivating embodied knowledge for physician as diagnostic instrument: (1) enacted cognition, (2) the processes of cultural affordances and kindling, and (3) Mauss's approach to habitus vis-à-vis body as technical object and technical means for achieving one's goal. I also look at the frameworks that resonate with Tibetan medical understandings of disease processes embodied in the patient: (1) the bioecocultural model of development and (2) biomarker approaches in biocultural anthropology and social ecology. These latter two theoretical tools were only briefly presented because I will develop them further later in their application to the Tibetan medical context.

Now we turn to the next chapter where I present a case study that presents Tibetan medical diagnostics in action. In order to begin unpacking the processes of cultivating embodied knowledge for Tibetan diagnostics, we must see how they work.

Chapter II
Diagnostics that Matter:
Embodied knowledge at work

Entering the Scene

The Dhauladhar Range pierces a brilliant blue expanse of sky. The jagged peaks dusted with snow tower over the narrow valleys and lush foothills and ridges below. Behind these pyramidal giants, an ocean of mountains extends, reaching all the way to Afghanistan, the Karakorum and beyond. This is a gateway to the stark highlands of central Asia and the Western edge of the Himalaya. Just a short distance to the east lies the Tibetan plateau, another imposing mountain-rimmed stark landscape, the roof of the world, the land of snows.

In some ways, it is hard for me to believe Tibet is so close to me, here in Dharamsala, India. The long journey from Delhi winds across the Gangetic flood plains, ascending slowly into geologically nascent hills—once stream bed stones and clay—covered by a thick layer of scraggly oaks. These foothills were lifted only recently in geologic history. Their young structural heights feel evident from their crumbling sides and quickly eroding cliff edges. Moving higher and higher through dense forests of towering yellow pines with trunks adorned by red puzzle-piece bark, the lush hillsides rise suddenly and in stark contrast to the wall of the Dhauladhars ahead.

Just before the foothills meet the rocky peaks, the sprawling Indian town of Dharamsala wraps around a wide valley, unfolding from the bazaar at the center. Small streets extend like spider legs across the valley, connecting commercial buildings and multistory homes. Cows and stray dogs move along the narrow roads with thick crowds

of people going about their daily business. Perched on the uppermost foothill along a ridge that leads up toward the Dhauladhars is the bustling town of McLeod Ganj, a former British military encampment. Only a few decades ago this town was simply a cluster of buildings, gifted by the prime minister of the newly minted independent Indian nation to the Dalai Lama when he arrived from his occupied homeland of Tibet. The Tibetan leader's new residence here is quite modest compared to the Potala Palace, the god-king fortress the size of a small mountain residing near the center of Lhasa. In India, the simple flat multi-building home rests on a crest of foothills above the Kangra valley with McLeod Ganj rising above it. The main temple, an extended courtyard for debate and teachings, and the monastic residences comprise the up-hill "backside" of the residence. Two main streets extend above and below the compound, eventually winding along the hillside to intersect above and form three small lengths of a crowded main street lined with street vendors and small window shops.

Although this town is located in India, it has a Tibetan appearance. Homes are adorned with prayer flags and red geraniums. They house Tibetan artisans and government workers, restaurant owners and teachers, and newly arrived refugees. The sound of Tibetan pop stars and recorded chanting prayers can be heard throughout the town. Courtyard houses of local Indian and Gadi, the local hill tribe, also dot the hillsides and valley faces. Indian vegetable and bread sellers walk the narrow dirt pathways, young teens ride motorcycles through the streets. A wide spectrum of international tourists mingles with Tibetan and Indian townspeople. Dharamsala has been the center of Tibetan exile life since the early 1960s and continues to host the main branches and institutions of

the Tibetan government-in-exile. A short walk down the steep and rocky dirt path from the residence of the Dalai Lama are the government offices and the Tibetan medical institute, Men-Tsee-Khang, also known as the Tibetan Medical & Astro. Institute of His Holiness the Dalai Lama [*sic*]. This is where I spent the first half of my five-year education from 2010 to 2013, studying Tibetan medicine and a cumulative three additional years prior, off and on from 2001 to 2010, learning Tibetan language, Buddhism, and working for the Emory Tibetan Studies Semester Study Abroad Program.

I have spent many years in Dharamsala. In 2001, I was a student there on the first inaugural Emory Tibetan Studies Semester Program in Dharamsala, a collaborative with the Dalai Lama's Institute of Buddhist Dialectics. I took a semester break from my physics studies at Stanford for the study abroad experience. In 2006, I came back as a teaching assistant for the program, assisting Geshema[39] Kelsang Wangmo with the Buddhist philosophy course. In 2009, I was assistant director for the program and lecturer for the Tibetan Culture & Civilization course. Throughout this time, I had completed a language program in Lhasa at Tibet University in 2002, and developed cultural learning programs in Kham, Amdo, and Ü-Tsang in 2007, 2010, and in Ladakh and Dharamsala in 2008, where we traversed the Indian side of the Tibetan plateau region called the Changtang. Thus, after spending extensive time in India and Tibet during my undergraduate years, I spent five years working for various programs in Tibetan regions inside and outside Tibet.

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[39] *Geshema* is the female version of *geshe* title.

Informally, I began my Tibetan medical studies with Dr. Khenrab in spring of 2009 while working as assistant director for the Emory Tibetan Studies Program and during the initial years of my graduate program at Emory. My admission to Men-Tsee-Khang after the second year of graduate school began my course toward formal education in Tibetan medicine, which took place from 2010-2013 in Dharamsala and 2013-2015 in Xining. When meeting the Dalai Lama for our annual audience in my third semester with the Emory Tibetan Studies semester program in 2009, one of his *geshes*[40], the director of his Institute of Buddhist Dialectics and co-director for our study abroad program, helped usher me forward to ask the Dalai Lama for guidance on where to pursue my studies in Tibetan medicine. The *geshe* had described my previous studies to His Holiness, including my time at Tibet University in Lhasa and Sarah College for Higher Tibetan Studies below Dharamsala, learning Tibetan language. The *geshe* conveyed his assessment that I could pursue the Tibetan medical path properly with my language skills in Tibetan.

His Holiness grabbed my hand and gently pulled me to his side as if I was an old friend or beloved niece. He smiled broadly and said, “I think…” letting his voice trail off in contemplation. “I think, Amdo. Because…” again he inserted a pause, “I’m from Amdo!” he exclaimed in a fit of laughter, clearly enjoying the jest of regionalism

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[40] A *geshe* (*dge ba'i shes gnyen*, literally, "virtuous friend”) is a terminal academic degree primarily in the Gelukpa school of Tibetan Buddhism, but also awarded to Sakyas and Bön monastics who complete the education. It is comprised of the study of Buddhist logic and debate, epistemology and ontology, sutras, monastic discipline, and tantra organized according to five topics: Abhidharma, Prajñā Pāramitā, Madhyamaka, Pramāṇa and Vinaya. The education can take as little as twelve years and as long as forty years. Kagyu and Nyingma schools administer a different terminal academic degree called *khenpo*, which emphasizes commentary over debate and a greater breadth of Indian classics. It takes an average of nine years to complete and culminates in a three year and three month retreat.

pervasive in Tibetan culture. “No really,” he said, “Historically, Amdo has had the most brilliant scholars—and still does to this day. So I think Amdo would be best. And of course, if not possible to study there, you are always most welcome here at Men-Tsee-Khang.” He patted my hand, giving it a tender squeeze and then left the room with his entourage, concluding the final moments of our audience with him.

I was both delighted that he gave such specific advice, and surprised that he would say Amdo. I had pondered whether Dharamsala Men-Tsee-Khang, the official Tibetan Medical and Astrological Institute of the Dalai Lama, was better than Tibetan medical education in Tibet, but my sense of the rigor of the latter was a hunch and not an informed insight. Dharamsala Men-Tsee-Khang often described itself as maintaining the truly preserved tradition, and I thought His Holiness would likely refer me to "his" institution in support of its efforts. However, his focus on educational quality seemed clear.

The first several years in my graduate program at Emory provided me with the opportunity to explore this advice when looking at the medical schools both in the Central Tibetan capital of Lhasa and in Xining, a city in Amdo — eastern Tibet. During a summer break from coursework, I led a trip through these Tibetan regions with the Colorado-based experiential education organization Where There Be Dragons. During our visit to Lhasa, we met with the Director of Foreign Affairs for the Lhasa Mentsikhang. I spoke to him for a few moments privately while our students looked at the Tibetan medical thangka paintings. I described my Tibetan language studies previously as a formal student at Tibet University.

"What do you think about the possibility for a foreigner to study Tibetan medicine here at Men-Tsee-Khang or in the Tibetan medicine department of Tibet University?" I asked him candidly.

"Most likely impossible," he responded, "But there is a good school in Nepal you should check out." I have been curious about his answer ever since. There was not a formal school in Nepal at the time, not until eight years later when a small school was established. I often wonder if it was safer for him to say Nepal over India, but that he expected I would know he actually *meant* India.

When our group traveled to Xining, a Tibetan colleague introduced me to the professor who I was told handled all foreign applicants to the school. The professor said that applying to the Tibetan medical school was fine, but that Qinghai University, which is the host institution for the Tibetan Medical School called Sorig Loling, requires that all foreigners pass the HSK, a national Chinese literary and colloquial proficiency exam[41], at a Level 8.

Passing this exam would have likely required at least two years for me to become sufficiently proficient in both written and spoken Mandarin Chinese. I was surprised, "Why would we need to pass a Chinese language exam if the entire education for Tibetan medicine is conducted in Tibetan?" I asked the professor.

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[41] The Hànyǔ Shuǐpíng Kǎoshì (HSK), which translates as the "Chinese Language Standard Examination," is the only standardized test of Chinese language proficiency for non-native speakers such as foreign students and overseas Chinese, in the People's Republic of China. Any foreigner studying at a Chinese University for a degree must show a high level of proficiency in Chinese language by this exam for admission. This has been an admission requirement even in minority region universities throughout China and degree programs administered in the minority language.

He laughed, “Yes, it does seem odd and unrelated to the needs for studying Tibetan medicine, but it is a national policy for foreigners studying in a degree program at any university in China.”

Aha, Chinese bureaucracy, I thought to myself.

“I know your Tibetan is good enough to study and do well in the Tibetan medical college,” the professor remarked, since my friend had described my academic background in studying Tibetan language and literature, and more recently in beginning studies of the *Four Medical Transmissions*. “However,” he continued, “This is a policy we cannot get around. Perhaps it is best for you to pursue your studies elsewhere.”

In several years, though, the policy requiring foreigners to pass the HSK Chinese language exam changed. I received the opportunity to transfer to Sorig Loling four years later in Xining, eventually following the advice of His Holiness the Dalai Lama, after pursuing my initial two years plus an initial preparatory year of Tibetan medical studies at Men-Tsee-Khang in Dharamsala. This sets the scene for how I began studying Tibetan medicine; but, to tell this story about embodied knowing, I need to go back further, to my first encounter with the practice of Tibetan medicine as a patient.

Encountering Tibetan medicine

By 2005, I had already had significant exposure to Tibetan medicine and was already impressed by its theory in its comprehensive approach and potential it provided for complete patient care. I had read all that had been published to date in English on Tibetan medicine and had begun my initial studies of the *Four Medical Transmissions*

with Amchi Khenrab Gyamtso, the Vice Principal of D'asa MTK I will introduce more fully shortly. I had also seen many patients in Dharamsala who had been successfully treated by Tibetan doctors for a wide variety of illnesses, such as gastrointestinal issues, neurodegenerative disorders, cancer, diabetes, thyroid conditions, autoimmune disorders, arthritis and so on, but I had not experienced it myself. In many ways, the benefits of Tibetan medicine still remained largely theoretical and second-hand to me, yet surely seemed to provide results, however impressive, slowly and mostly for chronic conditions.

The first episodes of the chronic condition that I would be treated for occurred in 2005. Before returning to Dharamsala for my second extended stay in 2006 as Buddhist Philosophy teaching assistant for the Emory Tibetan Studies semester program, I had spent several years working in wilderness survival, animal tracking and nature awareness. On an animal tracking course in rural Virginia in the summer of 2005, our group had gone out to a wooded region with dirt roads on a tracking exercise. Feeling dizzy and nauseous, I mentioned to a fellow student that I needed to go home and rest. As we drove back to our instructor's home where we had been staying, I could feel my insides rise up and churn. Several times along the way, we pulled over so I could vomit. Upon arriving at our instructor's home, I moved quickly to the upstairs bathroom, where the rest of my bowel contents released in loose watery stools. I could feel the room closing in on me and my consciousness seemed to slip away. Panic arose as if these could be the last moments of my life. I desperately called out for my friend to phone my dad for help. I was scared and uncertain. My dad reassured me that this was likely just severe dehydration and a

good idea to get to the emergency room as soon as possible for rehydration fluids and tests.

Parking in front of the local hospital emergency department, my friend supported me as we walked toward the main entrance. I lost consciousness and sank to the ground, as she and a nurse exiting the hospital caught my slack body. Conveniently, the nurse had been rolling an empty wheelchair, into which they hoisted me and wheeled me directly back to a patient room in the emergency department. I started shaking uncontrollably, and a couple of nurses wrapped me in a warming blanket as another placed a glucose drip in my arm. I was administered several pills of what I found out later was a nausea suppressant and pain medication. After two hours, I felt the internal malaise dissipate, and my friend mentioned that I was regaining my color and composure. After a couple hours, the nausea, diarrhea urges and pain subsided, and we returned to our instructor's house.

Upon returning to the house, I realized that it had been the first day of my menstrual cycle. Throughout my life, my cycles had passed without event. I had never experienced cramps, pain or discomfort of any kind, and being a competitive athlete and dancer, I had lost my cycle for six month periods several times during my life due to low body fat. I had worked with a nutritionist to restart my cycle during my junior year in high school, thinking its absence might bode poorly for general health and perhaps future reproductive potential. She had prescribed a hormone cream which restarted my monthly cycles, although with continued irregularity in timing.

This event felt unsettling. It did not seem necessarily linked to my menstrual cycle since it was not accompanied by cramping or pain, though the dramatic exodus of the

contents in my body may have distracted my attention from any degree of lower abdominal pain.

The next similar event occurred five months later at a holiday gathering in Santa Fe with the family of my boyfriend at the time. After a one hour light walk, nausea and the feeling of diarrhea erupted like the previous event months prior. Within forty-five minutes of returning to the house and relieving these urges, my body went into tremors and lower abdominal pain. My boyfriend's sister suggested a warm bath and provided me with some pain medications. Although the pain medications seemed to provide some relief, submerging myself into the hot waters of the bath seemed to ease the cramping pains most significantly and the physical ease that ensued allayed the vomiting or diarrheal urges. I stayed in the bath for an hour, then crawled into warm covers his sister had prepared thereafter. I slept for hours.

After this second event, I experienced no hardship with my monthly cycles for another year. Then in December 2006, after an intense workout of swimming and weight training at the local gym, I could feel the symptoms coming on again and went to a bathroom outside the weight room. I found myself on the floor of the bathroom slowly regaining consciousness. I realized that I had been out for at least a couple minutes. I knew I needed to get to a bathtub of hot water as soon as possible before the symptoms progressed. I left the gym and returned to my car. My partner was still inside the gym unaware of my condition. I tried to turn on my car, but my left leg was paralyzed. I could not push in the clutch, let alone turn on the car and operate the pedals. The paralysis seemed to be moving up my back and toward the right side of my neck toward the right

side of my mouth. I had grown up with migraines and it seemed similar to the droopiness or tingling I had experienced for migraines, but more frozen, and from the legs up instead of head down. I was panicked that I could not move my legs. I knew I needed to get help. I managed to get myself out of the driver's seat using the functioning half of my body to move the "frozen" half, and the paralysis disappeared.

I found my partner at the gym desk looking for me. "What's wrong? Where did you go?" he exclaimed startled, recognizing I was noticeably unwell. "I need to get home as soon as possible and get in a warm bath," I said quickly and mechanically, knowing that time made a difference in how the condition could worsen. My paralyzed leg seemed to be regaining feeling and he helped me get to the car. "*What* is going on?" he asked, more emphatically and clearly concerned.

"This has happened before," I said, "It's just been a long time since it did. It's my cycle. It can be really bad sometimes."

When we got home, I instructed him to fill the bath with hot water and to find some pain medications. A bit panicked, he took fast action. I took a strong dose of naproxen sodium and steeped in the hot waters. Soon the pain eased.

The next event did not happen till nine months later with similar symptoms except no leg paralysis, but additional symptoms of eye auras. Five months after that, these events started occurring the first day of every monthly menstruation. I mentioned it to physicians over the years, but their only consistent treatment recommendation was birth control pills.

On the third consecutive month of these events, I went to a gynecologist in San Francisco where I had recently re-settled. She ruled out endometriosis and ovarian cysts and cast the issue as an endocrine imbalance, also recommending birth control pills as "treatment." She also referred me to a neurologist to address the neural symptoms and migraine history. She conceded that birth control pills were the only treatment a Western doctor could recommend, even if my hormone levels were tested. She suggested I visit an acupuncturist.

I led a trip that summer to north India crossing the upper Himalayas of eastern Ladakh. I had learned that taking naproxen sodium before the symptoms intensified could preempt a full episode when accompanied by warm water bottles surrounding my lower abdomen and back. Heavy diarrhea, some nausea and neural symptoms would occur, but nothing as drastic as before. I managed the monthly events throughout the trip in this way.

Upon returning to San Francisco, I saw a few more specialists. Ultrasound confirmed that I did not have ovarian cysts nor endometriosis, and each specialist recommended birth control to address the symptoms. I was told that my experiences were in the normal realm of women's menstrual events and to manage it with pain medications and/or birth control. Due to my history of migraines and the risk of inducing seizures that birth control pills present, I did not want to use them as "treatment."

Several months later in the beginning of 2008, I moved to Lima for an engineering contract with the city municipality and made frequent trips to Bolivia to teach cultural ecology for a contract with another company. The naproxen sodium and hot

water bottles did not work that December, and when the symptoms progressed to an intolerable degree of pain my Peruvian friend took me to the local emergency room where I received a pain injection that quelled the pain and halted the cascade of symptoms.

After my contract in Lima, I returned to north India in December 2008 as assistant director for the spring 2009 Emory Tibetan Studies semester program in Dharamsala. I was also eager to improve my classical and colloquial Tibetan language skills with the aim of eventually studying Tibetan medicine. During my time in Peru and Bolivia, I had worked with several *curanderos* from across the Peruvian highlands and Amazon basin, specifically the senior *curandero* Don Alberto of the Macheguenga and Huayripayri tribe living in the region where Amazonian Peru, Bolivia, and Brazil intersect outside Pilcopata. The *curandero* systems, though impressive with their extensive *materia medica* and understanding of the macro- and micro-systems of the body and surrounding ecology, seemed challenged in developing a cohesive way to transmit medical knowledge in a more contemporary era. Don Alberto described his grandmother as having known how to use 5,000 plants. He said he knew close to two thousand plants, and his young niece, whom he had selected as an apprentice, would likely only learn a few hundred. It was clear the knowledge and practice of this tradition was disappearing rapidly, a tradition exclusively embodied in the knowledge of the individuals, with no textual support.

Meeting a doctor, meeting my teacher

I met Dr. Khenrab Gyamtso through an introduction by Ani Kelsang Wangmo, a senior Buddhist nun, now first woman *geshe*[42] at the Dalai Lama's Institute of Buddhist Dialectics (IBD) in Dharamsala. She had described Amchi Khenrab's humble attitude, incisive diagnostics and effective treatments. Although he had also served as a leader in the Tibetan community as the election commissioner appointed by the Dalai Lama, his main role was Vice Principal and senior lecturer of D'asa Men-Tsee-Khang. As with many *amchis* in high administrative or departmental positions in the institute, he also saw many patients out of his home early every morning before he began his work day.

When I first met him, Amchi Khenrab had come down to Sarah College of Higher Tibetan Studies, where our study abroad program resided, to do patient rounds among our students and the Tibetan students there. I made an appointment to see him because I was curious what Tibetan medicine might say about my strange condition.

I had collected my first morning's urine, familiar with the standard diagnostics *amchis* assess in a Tibetan medical examination. I handed it to him in a reused plastic water bottle with the label removed and sat on a seat next to the desk the school had prepared for his consultations. He looked at the urine intently, bringing it closer to his eyes to see the fine details in the urine. He then moved it further away from his eyes to shake it and analyze the bubbles as they formed. He opened the cap on the bottle and

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[42] Though foreign, Venerable Kelsang Wangmo's achievement of first female *geshe* (conferred in April 2011) is a significant event in Tibetan Buddhist history and a tribute to her excellence in scholarship and debate. Several cohorts of Tibetan nuns have since achieved the degree as well.

wafted his hand across the opening to assess the smell. He did not say much, just nodded knowingly.

He had me sit down across from him and reached for my right wrist. Wrapping his index, middle and ring fingers around my radial artery, he depressed each finger at different depths along the pulse. He turned his head slightly to his left, as if his right ear was listening to the pulse at the same time that he assessed the characteristics transmitted under his fingers. It reminded me of a musician pressing the strings along frets of a guitar, engaging each string slightly differently to allow the ear to distinguish distinct notes and coordinate harmonies that emerged when they were strummed. After a few moments, he switched sides, taking my left wrist and aligning his right index, middle and ring finger pads along my left arterial artery, leaving minute spaces between his fingers. It felt like his awareness was reaching deep inside my body, assessing the function and pathways of various organs, systems and regions.

"Stick out your tongue," he said. I felt slightly self-conscious having someone peer so closely to the details of my tongue, but complied, understanding this would likely provide helpful information to him. I was intrigued that someone could have access to the inner workings of my body simply by their own sensory perception.

"Your kidneys are cold," he said, "How are your menstrual cycles?"

"That's the issue," I said, "They used to be fine and over the last several years they have become terrible. I vomit, have many rounds of diarrhea, severe pain and lose consciousness most times. It first happened several years ago, then a half year later again.

But now it is increasing in frequency and severity. The only thing that seems to help is a hot bath or hot water bags around my mid-section."

He nodded his head as I explained the symptoms. "This is a classic condition in Tibetan medicine," he said.

"Really?" I exclaimed.

It was hard for me to believe that this condition would be common enough to be described as a classic disorder in a medical system or that other women experience such extreme symptoms. I had never heard of any other woman going through such intense monthly events. Yet I hoped for relief. I knew my symptoms were not normal. "Yes," he said, "Many Tibetan women have this condition. You can treat this condition by having a baby or taking medicine," he smiled playfully, yet serious.

"It will go away if I have a baby?" I asked, surprised.

"Most likely," he said.

This reminded me of many lay discussions of how pregnancy could alleviate symptoms associated with endometriosis. However, the physicians I saw about my condition said I did not have the endometrial tissue proliferation growing in or around my uterus that characterizes endometriosis[43].

"Well, having a baby is not an option for me," I said, "So I'll take the medicine."

Amchi Khenrab wrote down the prescription, and later that day I and the other students he had seen made the trip up to the Men-Tsee-Khang pharmacy to fill our

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[43] Though the causes are not clear (see for instance, Bulletti et al 2010), it is possible that I had a precursor condition to endometriosis.

prescriptions. Each prescription came as different medicinal pills of earth-colored pellets comprised of various compounded herbs and minerals.

Ani Kelsang Wangmo had formally introduced me to Amchi Khenrab as a serious student who is interested in pursuing Tibetan medical studies. She asked him if he would be willing to teach me. She had been Amchi Khenrab's patient for years, and her position carried much weight and respect[44]. She described my years of training in Tibetan language, classically and colloquially, inside and outside Tibet, as well as my regular attendance of classes with Tibetans at Sarah College and soon the Madhyamika philosophy classes at IBD with Tibetan lay people and monastics when the Emory semester program shifted our residence and classes up the hill.

At first, he seemed resistant to accept me as a student, as clearly he was extremely busy, and perhaps he had seen too many Westerners wanting to study Tibetan medicine without the realization of the requisite effort, commitment and long years of dedicated study it required. However, as Ani Kelsang Wangmo spoke on my behalf, he considered the proposal, began opening to the idea, and finally agreed. "Come to my office each evening at 5. I will teach you in my office once my day's work is done," he said.

I almost leaped in elation. I could not believe that he agreed. We would be moving the program up to McLeod Ganj closer to Men-Tsee-Khang the following week, facilitating an immediate start of lessons.

Beginning studies, experiencing treatment

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[44] I would learn later that such introductions by someone esteemed in the society strongly influence the willingness of an *amchi* to take on a new student.

The first day I came to his office for class, I could feel my stomach twisting in knots. I walked up the cement steps into the dark entryway of the college part of the Men-Tsee-Khang campus buildings. His office was located up a side staircase on the second floor where the principal and faculty offices were nestled across from the small school library room. I noticed that his office seemed more prominently placed than the principal's office, which I found out later practically demonstrated the greater responsibilities he shouldered for the institute as well. His office was modest but filled with book shelves of texts and administrative files.

"Sit down," he said. I felt confident about my written and spoken Tibetan skills for years by then, but I wondered if my skills would be sufficient for all the new medical terminology and explanations. Amchi Khenrab asked me to bring the version of the *Four Medical Transmissions* that included the English translations for the first two sections of the four-part text that Men-Tsee-Khang had translated and published a few years prior.

"We will start with chapter one of the *Root Transmission*," he said, and continued, "This is the great city of *Tanaduk*, which literally means 'Beautiful to Behold…." He explained stanza by stanza, explicating difficult terms of phrasings. I noticed that the text was written poetically with many missing grammatical particles that would normally clarify meaning. It was immediately clear why the text would need to be explained by an experienced teacher. I remembered many Buddhist translators refusing to translate public medical teachings because of the entirely different lexicon, many of which are identical terms as in Buddhism but are given different meaning in the medical context. "Our students memorize the text," he said, "I won't make you memorize for now—focus on

the meaning—but if you really want to study properly, you will need to memorize." I agreed and expressed my sincere interest in studying properly.

The next month when my menstrual cycle arrived, the pain was still severe, but the nausea and diarrhea seemed less extreme. During one of our class sessions, Amchi Khenrab checked my pulse again and adjusted my prescription. He reminded me that, because my condition had been present for many years, the medicine would take awhile to fully treat it. He encouraged me to be patient and continue taking the medicine regularly. He also said that it was important for me to drink warming fluids and food, not to let myself get exposed to cold, and to keep my lower back warm. He also said that I needed to be careful in managing my *rlung*[45] so that it does not proliferate from getting overly stressed.

Unfortunately, the subsequent months of menstrual cycles seemed to increase in severity with each passing month. I called our Buddhist teacher, the head of IBD[46], to see if there was a visualization or meditation method I could use to work through the pain. I knew that some high Buddhist practitioners could isolate their response to pain. He laughed and said that meditation would not help me stop throwing up. I was not convinced since I noticed that I could calm my mind and manage some of the symptoms, but I realized that I had minimal Buddhist practice so this might have been a far reach to ask for any advanced techniques or practices only available to skilled practitioners. The next month, Amchi Khenrab suggested I take a precious pill three days before my cycle

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[45] rLung is one of the three functional energetic systems that trace psychophysiologic pathways in the body. It is particularly susceptible to stress, causing any condition to worsen. I will explain rlung more fully later in this work.

[46] Geshe Kelsang Damdul

along with his regular prescription. However, my cycles were too erratic to predict the three-day marker.

Amchi Khenrab did not seem alarmed that the symptoms were increasing, and simply reminded me that the condition cannot be treated fully immediately. The following months of cycles were even more severe. Several close women friends stayed with me during the menstrual events, and those who had gone through child birth said it was as if I was giving birth "or worse." I did not feel like this was a normal experience women have, as the gynecologist in San Francisco had told me.

Despite the difficult experience with my menstrual cycles, I was not dissuaded in my studies. I was impressed by the conciseness of the text, its insight and its poetic beauty. With each chapter, my interest in studying Tibetan medicine formally and properly grew stronger, and with each class session I felt more compelled to pursue this path professionally. "What would it take to enter Men-Tsee-Khang College?" I asked Amchi Khenrab.

"It would be very difficult," he said, "It is a five-day, three hours per day entrance exam, where we examine the students on the classical grammar texts, basic Buddhist logic, general Tibetan cultural knowledge, translation and so forth. If you are really serious about sitting for the entrance exam, you will need to study very hard, especially improving your written Tibetan skills and knowledge of the classical grammar."

"I would like to do it," I told him, resolutely.

Introducing the tools of embodied knowledge

One of the most exciting chapters of the *Root Transmission*, and my initial classes on Tibetan medicine, was on diagnosis. It conveyed a sense to me that this was a completely different medical system, one in which my body, sensory capacities and mind would become the diagnostic instruments themselves. The beginning of the diagnostic chapter of the *Root Transmission*, highly condensed and pithy like the rest of this section of the *Four Medical Transmissions*, read as follows:

> Illness is completely understood through means of observation, touch and interrogation.
>
> The eyes visually assess the tongue and urine;
>
> This examination is the study of objects of the visual field.
>
> The fingers touch the channels, which are the messengers transmitting integrated communications; this examination is the study of discerning meaning.
>
> Speech interrogates arising conditions, symptoms and diet; this examination is the study of listening to sounds.[47]

The text of this chapter continues by describing the qualities of the tongue one should look for, linking sets of symptoms exclusively to the three *nyépa* (functional energy systems)—*rlung* (literally "winds" meaning principles of motility, linked to neuroendocrine pathways), *tripa* ("heat," linked to metabolic heat), and *béken* (principles of solidity and fluid, linked to muscles, fluid spaces, and all body matter). A *rlung* tongue is described as red, dry and rough; a *tripa* tongue is thickly covered with a whitish yellow

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[47] ནད་ལ་བལྟ་རེག་དྲི་བས་ཡོངས་ཤེས་བྱ། །མིག་གིས་བལྟ་བ་ལྕེ་དང་ཆུ་ལ་བརྟག། བརྟག་པ་འདི་ནི་མཐོང་བ་ཡུལ་རིག་ཡིན། སོར་མོས་རེག་པ་བརྒྱུད་འཕྲིན་པ་རྣམས་ཀྱི་དབྱེ་བ་དོན་རིག་ཡིན། དག་གིས་དྲི་བ་སྔོང་ཆུན་ན་ལྟུགས་ཟས། །བརྟག་པ་འདི་ནི་ཐོས་པ་སྒྲ་རིག་ཡིན། (TI Ch 4:25). Unless otherwise noted, all translations are my own.

coating, and a *béken* tongue is lightly-colored, opaque, dull, smooth and moist. The qualities of each type of urine and each type of pulse are described thereafter.

What intrigued me most about these descriptions were the highly metaphorical depictions of the three pulses. A *rlung* pulse "floats," is "hollow," and halts intermittently. I pondered, what does it mean to have a "hollow" pulse? Amchi Khenrab described that when you press down on the pulse for a *rlung* pulse, you feel it initially, but as you apply pressure, it disappears. This does not occur for a *tripa* or a *béken* pulse, he said. Likewise, the *rlung* pulse feels like it is bobbing in water, he said. It will have an irregular beat, often stopping momentarily, then beating sequentially for several beats and then another halt, then a beat, and so on—an irregular beat that seems to pause at times. These metaphors provide rich descriptions of pulse qualities that seemed difficult to assess without a cultivated sensitivity and guidance from a teacher to confirm that one is picking up the correct qualities.

The chapter describes the *tripa* pulse as quick, "spreading," "taut," and "leaping." "You will know when you have a *tripa* pulse," said Amchi Khenrab, "Because it feels like a rope that has been pulled tight and surges as it beats." The *béken* pulse is "lethargic," "drops off," and slow. Amchi Khenrab explained that the *béken* pulse feels like there is weight behind it and will feel like it is declining. He reminded me that this is just the condensed version of pulse diagnostics and that later chapters, particularly one chapter in the fourth section called the *Subsequent Transmission*, would elaborate on pulse analysis significantly, adding in many layers of organ function and pathology, illness types, and, if a woman is pregnant, whether it is a boy or a girl. I delighted in this

possibility. It seemed like magic to me, and yet appeared as straight-forward as learning a new language with an alphabet, words and grammar.

The chapter in the *Root Transmission* before the diagnostics chapter introduces concepts of health and illness, the definition of the body, and causes and conditions that affect health and illness including diet, environment, season, behaviors and mental patterns. It describes the paths through which illness enters the body and the pathways for the *nyépa.* Each of these concepts seemed to require subtle understanding and perceptual assessment of function and dysfunction, as well as how these *nyépa* pathways behave in the body and the various influences that affect them. Skillful attention to observation in the natural world and of one's own body trains physicians to make similar skillful assessments of their patients, said Amchi Khenrab. Training in this medical system requires an education in developing perceptual means and cultivating an embodied sense of assessment, I realized. Later, I would find out that there is elaborate theory within the tradition on how one should go about such training—and a long, technical and ritualized path to do so.

New developments in my studies

Toward the end of the semester program, after Amchi Khenrab and I had completed three months of study together and had begun the *Explanatory Transmission*, which is the second of the text's four sections, I told him about the possibility of beginning doctoral work. I expressed to him that it was my intent to do graduate studies in a field where I could train in science, and complete my medical studies in the Tibetan

medical tradition to become a fully qualified Tibetan medical doctor. He supported this plan, recognizing the importance of having an advanced degree in the West and the opportunities it would present not only for me, but also what I could do for Tibetan medical research in expanding its scope and understanding in the West. He, along with many Tibetan physicians at Men-Tsee-Khang, values the role of science in bridging understandings of the Tibetan medical system with a Western audience and communicating Tibetan medicine's value to the new generation of Tibetan youth educated in science. I told him that most likely I would be returning to Dharamsala to Sarah College to improve my classical Tibetan language skills the following fall and prepare for the entrance exam there. However, I asked him, were I to get into graduate school, whether he would be willing to continue our sessions over Skype. He said he would be open to it and suggested that we see what developed over the summer.

That summer I led another trip to the Peruvian Andes and Amazon. Initially I managed my menstrual cycle reasonably well with soft muscle relaxants and oxycodone, but I did make one trip to the local clinic for stronger pain injections and nausea suppressants. While coming through Cuzco in between trips into the field, I found out that I had been accepted to the Anthropology doctoral program of Emory University and would need to begin the program that fall. My entrance into the doctoral program also had the understanding of a joint plan of sitting for the Tibetan medical school entrance exam in my third year of graduate study and combining my Tibetan medical studies with the doctoral research.

I moved to Atlanta in August of 2009. That month, my menstrual cycle was the worst it had ever been. One night I awoke from vivid, intense dreams and a subsequent lengthy migraine. An early stage of blood arrived that was dark, unusually brown, and had apparent accumulations and clumps. I could feel the cramps and pain setting in and the cycle begin to start. I had tried to head off the symptom cascade with soft muscle relaxants and oxycodone earlier, but the pain overrode the medications. I called my dad for dosage, but I had already taken the maximum recommended. I screamed and writhed in pain on the bathroom floor, then in the bathtub, then circling the toilet between bouts of vomiting, diarrhea and cramping. My roommate, who was also a close friend, woke up to my anguished moans and was shocked and panicked. She tried to get me to go to the emergency room, but I could not bear the idea of getting up and could not see how doing so would help beyond them giving me heavier pain medication. I felt dizzy and seemed to come in and out of consciousness. The oxycodone seemed to help me drift away between the waves of pain. As I woke up the next day in a stupor and began to regain my strength, my friend and I discussed the untenability of being able to handle the monthly events on my own and the potential threat it presented to my life. At times, I felt I might truly die from whatever was creating the pain inside me.

During the previous three months in Peru, I had not been consistent with taking the Tibetan medicine. With the intensity of the August menstrual event, I resolved to diligently take the medicine, and to begin exploring other specialists for other opinions on the condition. I became a “model patient” in taking my doses of Tibetan medicine and tried to preempt each cycle with a precious pill. Startlingly, within two months, my cycles

had returned to the experiences I had had for most of my prior life—minimal cramping, no nausea or diarrhea, and largely uneventful cycles. All neurological symptoms had dissipated as well. The menstrual blood had also regained its bright red color and smooth consistency. The cycles continued with normalcy month after month for several years thereafter.

What can embodied knowledge do in diagnosis?

At the time, I had no idea what Amchi Khenrab had done to understand my condition. On one hand, it seemed my condition could be diagnosed simply from the set of symptoms I described, and that he observed during the beginning of my studies with him. However, there was something more that he read from my urine and pulse that told him how long the condition had been going, how severe it was, and gave a prognosis of how it might respond to medicine. He adjusted my prescription slightly during the course of my treatment, and sent me off from India with a half year supply assuring me that he could sent more as needed[48]. He seemed to integrate various pathways and systems in my body as he diagnosed and explained my condition to me. He described my poor digestive heat, and the concern of my extremely low blood pressure and slow faint pulse. I had always understood my low blood pressure and slow pulse as a sign of my athleticism, a lifetime of being a runner, dancer and athlete, particularly in the high-altitude environment of Colorado. However, he said there was a quality to my pulse that was "cold" and "trailed off" and that this could cause problems for me later in life. He said

[48] Since he came to Emory for spring semester on his sabbatical, I was able to get more medicine from him in person.

that the characteristics in my pulse also explained my history of migraines and the migraines related to my current menstrual condition. He explained how my cold kidney region exacerbated my low digestive heat and the disruptions of the reproductive pathways. He asked about my mental symptoms with the same valence as my physical symptoms. He would question me as to whether I am easy to anger, mentally foggy, or erratic in my thought processes in one breath, and then about my digestion, heart palpitations, regions of pain, and menstrual blood characteristics in the next breath. He did not relegate psychological symptoms to one category, and physical symptoms to another; but instead he seemed to integrate these systems, and the pathways they tracked also seemed to have coordinated mental and physical aspects. I was impressed by the full system approach of Tibetan medicine.

Amchi Khenrab described how my condition might eventually lead to uterine cancer if left untreated. Looking back, I can clearly see the progression of these symptoms. Three years later, in 2013 during my second year at Men-Tsee-Khang, I encountered inordinate stress and experienced recurrences and exacerbation of the monthly menstrual event symptoms. I did not take Tibetan medicine during this time, simply persisting day-to-day to get through my studies. I came home to Colorado on sick leave from Men-Tsee-Khang with peptic ulcers throughout my gastrointestinal tract, six-hour migraines daily, and pre-cancerous cells on my cervix found during a gynecological check-up. The relationship Amchi Khenrab explained about my underlying condition seemed clear—and manifested—a Tibetan medically predicted cause and effect.

In the late winter of 2014, during my third year of coursework and six months into my concurrent internship at the Tibetan medical hospital in Xining, I saw the same condition among many Tibetan women patients. Because I was given permission to intern in the hospital concurrently with my coursework, I completed patient rounds each morning before heading to class mid-morning. I felt delighted to begin our class on women's health conditions and gynecology. I could finally understand the theoretical nuances of this condition that had distressed me and confounded many of my Western physicians.

Gen Pakmotso, the only female teacher among the faculty, taught our women's health class. As customary with each class, we were expected to have memorized the chapter before class began or in the initial several weeks of the semester, at which time we would be tested orally on the section[49]. The women's disorders section of the *Four Medical Transmissions* begins with enumerating *trak-tsab*[50] and *rlung-tsab*[51] as the two main divisions of general women's disorders. "At the time that it is new, it is called *trak-tsab*," the text states (TIII, Ch74: 432). "When it becomes old, it becomes compounded by *rlung* and is known as *rlung-tsab*" (*ibid*).

Trak-tsab is primarily identified by the following symptoms: trembling and pain in the back, urethra, and lower extremities[52]. Other symptoms may include pain

[49] This is unlike D'asa Men-Tsee-Khang where all oral examinations would be held simultaneously at the end of the curricular year.

[50] ཁྲག་ཚབས།

[51] རླུང་ཚབས།

[52] དེ་རྟགས་ཁྲག་ཚབས་ཀྱི་ཡི་མཚན་ཉིད་ནི། རྐེད་སོ་མན་ཆད་རྣུས་པ་འཁོལ་ཞིང་ན། (TIII, Ch 74:432)

accompanied by heat in the lower abdomen, sharp pain in the upper back and diaphragm, a feeling of heat and tingling through the channels. It may also include a rash with small raised bumps or blisters. Spotting may occur during non-menstrual periods, as well as an absence of blood or occurrences of clear discharge[53].

Rlung-tsab is marked by trembling of the bones, uneasiness of the heart, dizziness, feeling as if one's skull bones have chills, chills throughout the body, swelling of the flesh, seeing a coating[54] on the skin and flesh with a feeling of pain in between the two types of tissue, and bloating and tingling. Other symptoms that may occur include ocular occlusion, proliferation of disturbed thoughts, loss of consciousness, loss of memory, tightening at the urethra and lower abdomen, loss of nutritional essence (*dangma*[55]), and unceasing menstrual blood emptying from the uterus.

My own experience with this condition gave me informed eyes through which to read the symptoms and their manifestations when they progress chronically. Textually, many of the details of these two related conditions seemed like mere skeletons of the actual experience of the conditions. I reminded myself that this is likely the case with most if not all the conditions we read textually. Likewise, Amchi Khenrab had diagnosed me with *trak-tsab* for several years because of the nascency of the condition even though my symptoms themselves matched *rlung-tsab* more completely. I would find out later when I formally learned about these conditions in class that, though the symptoms of

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53 རྒྱུ་ཞབས་ཚ་འབྲབ་རོ་རྒྱབ་མཆིན་དྲི་གཞེར། རྩ་རྣམས་ཚ་འཕྲུག་ཤུབ་འབྲུམ་ཕྲན་འོང་། མངལ་ཁྲག་འཛག་གམ་འཁྲིལ་དང་རྣག་ཏུ་འགྱུར། (TIII, Ch 74:432). See Jampa Drolkar 2011:10 for further explanation on རྒྱུ་ཞབས། as a term.

54 ཕྱིའི་རྩི།

55 དྭངས་མ།

trak-tsab and *rlung-tsab* are distinct, the primary differentiating factor between the two conditions is chronicity of symptoms. Before listing the symptoms for each of the two conditions, the *Four Medical Transmissions* states, "When the condition is new, it is referred to as '*trak-tsab'*; when the condition has aged, it is called '*rlung-tsab'* because it has become compounded by rlung"[56] (TIII, Ch74:432). If one did not know how long such a condition had persisted for a given patient, then one's experience of providing care and observing outcomes would be central. This process also recursively informs future diagnoses that may unfold through the course of treatment.

I had to envision how the symptoms would look in other women with many accessory symptoms related and unrelated to the condition, diverse environmental, social, dietary, lifestyle and psychological causes and conditions that bring on that specific condition. Women seeking help from Tibetan medical physicians is relatively new in Tibetan history (Craig & Adams 2009; Craig 2012) due to limited medical access in the remote regions where women reside (men travel a great deal more than women) and due to their modesty, resources and position in society (Fjeld & Hofer 2011; Craig 2012; Rajan et al. 2016; Rajan 2016). These days, increasing numbers of women are becoming Tibetan medical doctors, and increasing numbers of women are seeking medical attention for various conditions. This means these conditions are being seen professionally in the Tibetan medical field with greater numbers.

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[56] གསར་པའི་དུས་ན་ཁྲག་ཚོགས་ཞེས་བྱ་སྟེ། །རྙིང་ན་རླུང་རྩུད་དང་བསྡོམས་པས་རླུང་ཚོགས་སོ། (TIII, Ch74:432)

My first diagnostic case of *rlung-tsab* came early during my internship experience, the first patient that my mentor gave me to diagnose on my own.[57] Drukgyal Tso arrived accompanied by her husband in our departmental office on a quiet afternoon in mid-February. She wore heavy wool layers of the traditional Amdo *chuba* obscuring the size and shape of her body, and seemed to walk straight out of the rugged cold nomadic hills from which she had traveled several days to come to the city center of Xining. Most nomads had a winter encampment that was closer to roadways and usually consisted of a built earthen block home with fire hearth for cooking and heat. Nevertheless, she carried the signs of weather hardened skin on her face and hands, and the wrinkled folds of her face and stern expression seemed to indicate an age much older than her actual years. She sat on the bench next to Dr. Drukjal's desk, ready for her patient interview, her hands folded into each other in a reserved and quiet demeanor. She seemed nervous and cast her gaze downward shyly, slightly more than the normal northeastern Tibetan female tends to display.

Despite my familiarity with patient protocol in the hospital and taking a patient interview, I felt nervous beginning with my first real patient. "She's all yours," Dr. Drukjal proclaimed. He was sitting at the computer inputting patient data from our morning rounds. The new patient looked at me, wide-eyed, likely quite surprised by the foreigner in a white doctor's coat[58] who was just told to be her managing physician.

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[57] See Chapter 1 Appendix 1 for actual field notes on case study (18 February 2014).

[58] Hospital policy requires all doctors and interns alike to wear white doctor's coats.

"Don't worry," I quickly said to her, "I am just a medical student, he is your real doctor and will be the one actually taking care of you." She nodded.

"What seems to be the problem?" I asked her.

"My lower abdomen (*gyushab*)[59] hurts. It has hurt for about five or six years, and the pain has worsened in the last month — so I thought I should come in," she said, in a spurt of words that seemed uncharacteristic of her initial reserved demeanor.

"What else?" I asked.

"My stomach hurts," she pointed under her rib cage, just below her sternum.

"Does the pain worsen after you eat?"

"No."

"How about with oily foods?" I probed further.

"There doesn't seem to be a difference," she said, "I often feel nauseous."

"No difference when hungry or while eating either?"

"It hurts a bit more without food."

"How about differences in the pain in your lower abdomen?" I asked.

"Afternoon. It hurts more then, and I have a lot of bloating."

"How are your menstrual cycles?" I asked, "Regular?"

"Regular."

"How long do they last?" I followed.

"Three to four days."

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[59] རྒྱུ་ཞབས། The term "rgyu-zhabs," meaning "foot of the small intestine" is linked generally with the lower abdominal region. Pain in this area is linked with lower abdominal cramps characteristic of gynecological conditions and menstruation. Other related symptoms clarifies such references.

"Color?"

"Red, like normal."

"Do you experience much pain, headaches?" I asked.

"No," she said, "No pain, no headaches. But I feel itchy, especially when I urinate," she said.

"Do you have a lot of discharge?" Dr. Drukjal's intern interjected.

"Yes," she said.

"How is your lower back pain (*khal-khé*[60], lit. "kidney-back")?" I asked.

"It hurts."

"Difference between right and left sides?" I asked,

"No, no difference," she responded.

I was building her case by now. "Do you get dizzy easily?" I asked, referring to a classic symptom associated with the Tibetan medical condition that was emerging.

"Yes," she answered, "And headaches."

I reached for her right wrist to take her pulse. Familiar with the Tibetan medical diagnostic protocol, she offered it as soon as I started to reach. Her left wrist pulse was average in its flow with some drop-off on the tail end of its pulses. Her heart pulse was floating and unsteady, characteristic of *rlung*. Her liver pulse was taut with more of a pounding quality. Her stomach pulse seemed to protrude as well but not overly so. Her kidney pulses were a bit hot for her overall pulse signature. And her *samseü*[61] pulse, a

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[60] མཁའ་སྐེ་ལ།

[61] བསམ་སེའུ།

pulse often connected with the reproductive and neuroendocrine system, was a bit prominent. Her lung pulse was reserved and quiet.

Interestingly, the chapters on *trak-tsab* and *rlung-tsab* do not explicitly describe pulse details for these conditions unlike many other chapters in the *Oral Instructions Transmission*. However, one applies the pulse characteristics of the pathways in this instance as the commentaries instruct[62]: a proliferation of blood would register an overall protruding, twisted and pounding pulse[63], likely in the *samseü* pulse and possibly in the liver/gallbladder pulse. One would also assume a *rlung* component to the pulse, likely in the heart[64]. A *rlung-tsab* pulse would have a much stronger *rlung* signature while still having a pulse that indicates blood proliferation[65]. One would expect to see a protrusion in the *samseü* and heart pulse as well. There is often more impact in both kidney pulses too.

"Do you experience sensitivity along your spine when I press?" I asked, applying pressure at the *rlung* points along her spine.

"Yes," she said reacting to the pressure, "That's painful."

She had not brought her urine for examination as is customary for many of the patients from the region south of Yushu and Tibetans residing in India. Most Tibetan

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[62] བྱང་ནོར་མ་ལས། ཁྲག་ཚོགས་སྤྱི་ཡི་མཚན་ཉིད་ནི། རྩ་ཚ་ཆུ་ཡང་དམར་བ་ཡིན། (Jampa Drolkar 2011:10); བོད་དམར་ལས། རྩ་མཁྲང་ལ་རྒྱས་པ་འབྱུང་། ཆུ་ནི་ཆུ་རྒེ་ཁུ་བ་འདུ། མདོག་དམར་རམ་སྐྱ། (ibid.)

[63] ཁྲག་གི་རྩ་ནི་འཕྱར་ལ་འདྲིལ་བར་འཕར། (TIV, Ch 1:218)

[64] སྙིང་གི་རྩ་ནི་ཀུལ་སྟོང་སྐབས་སུ་སྟོང་། (TIV, Ch 1:218)

[65] བོད་དམར་ལས། རྩ་ཕུ་ཞིང་དལ་ལ་སྟོང་བར་འབྱུང་། (Jampa Drolkar 2011:11)

physicians in India typically request patients to bring their urine, but this had not become routine in Amdo.

Thus far, it seemed like her symptoms, along with *rlung-tsab,* were indicating a *béken mükpo*[66] issue, which is a combination of imbalance in all three *nyépas* and often results in peptic ulcers or other advanced gastritis conditions including gastric adenocarcinomas. “How are your bowel movements?” I asked, “Do you have dry stools[67]?”

“Yes, dry stools, often” she said.

“Color?”

“Yellow.”

“Smell?”

“Smelly.”

There seemed to be quite a bit of *tripa* in her system, despite the *mazhuwa*[68]*,* which is a form of metabolic disruption, underlying conditions and exacerbation of *rlung* influences.

“Are you a nomad or a farmer?” I asked, confirming her belonging to one of the two dominant lifestyle types in the region, though fairly confident in what her response would be.

“Nomad,” she said.

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[66] བད་ཀན་སྨུག་པོ།

[67] བཤད་བ་སྐམ་པོ།

[68]མ་ཞུ་བ།

"Where's your home area?"

She responded with an area I had not heard of.

"Same *phayul* [home area] as Dr. Loden," said Dr. Drukjal for clarification referring to one of the junior doctors.

"I also have low blood pressure 90/60," she added. This information surprised me since her pulse did not seem to indicate low blood pressure. I knew the nurses just took her blood pressure when she arrived in the department, and they would continue to monitor her vitals three times per day for the first three days, so I made a mental note to check their continued assessments.

"How is your mind [recently]?" I asked.

"Aggravated," she said.

"When just resting or when interacting and engaging with people, thinking and so forth?" I asked further.

"When I am just thinking."

"How is your sleep? Dreams?"

"Sleep is good," she said, "Not sure about my dreams. But my knees hurt a lot in cold weather," she said.

"How about your wrists? Elbows?" I followed.

"Wrists, no. Elbows, yes."

A complicating case of *drumbu*[69] (a condition that maps onto various arthritis conditions in the Western medical system), I thought, which makes sense with the stomach and *mazhuwa* issues, as well as the type of gynecological condition.

"Stick out your tongue," I requested. Pink, moist, and thick with white coating. "Do you have a bitter or sour taste in your mouth?" I asked.

"No."

"How is your hunger?"

"Good," she said.

She never described the same debilitating cycles, vomiting, diarrhea or loss of consciousness that I experienced with my *trak-tsab* condition. However, I had to remember that a condition manifests differently in different people, and a given condition which presents similarly across individuals may actually be distinctly different disorders. Tibetan medicine uses whole person diagnostics that assesses a condition based on all its contributing factors of diet, lifestyle, social and physical environment, constitutional personality, disposition, and physical proclivities and so forth. It looks for the subtle causal trajectories emerging from this multitude of influencing conditions.

Although I had observed hundreds of patient interviews by this time, this particular interview impressed upon me the respective roles that symptomology and pulse take in providing the diagnosis. My advisor Mel Konner had reminded me before heading into the field that, "even in Western medicine 85 percent of the information needed to make a diagnosis is in the patient history, with most of the rest coming from

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[69] གྲུམ་བུ། pronounced "*drumvu*" in Amdo dialect.

tests" (Konner 1987:130). Similarly, the patient history, including the symptomology, could play a major role in diagnosis, and in many cases was critical to narrowing into the diagnosis, whereas the pulse seemed to provide primary and relative organs of concern with the level of severity. Tibetan diagnostics seemed like it could never pinpoint region of an illness with the specificity that some Western diagnostics, such as various imaging technologies, can. However, it seemed to be able to pick up the initial stages of a condition sooner than many Western diagnostics. I knew she would be undergoing the usual procedure of full diagnostics—X-ray, MRI, ultrasound, EKG, blood and urine labs, and for her specifically, likely stool and cervical discharge tests, and an endoscopy. I was told that hospitals throughout China use such comprehensive diagnostics for most patients no matter how small the conditions, particularly for insurance reimbursement purposes. Documentation of the condition and lack of complicating conditions was important for the insurance to verify. I found this practice of comprehensive diagnostic tests regardless of condition severity to be excessive on one hand, but significantly helpful for my learning and research purposes. Any patient who came in to our department had most of the same diagnostic tests performed, and I could confirm my own pulse and urine analyses, as well as consistencies with the symptomology I had taken in the patient interview and examination. Particularly early on in my time in Xining when my Amdo dialect language skills were poor, this was a primary way that I could confirm my pulse and urine assessments with the patient condition. I found the volume of patients and the repetition of these diagnostic moments an invaluable learning context.

I also could track when Tibetan diagnostics caught something before Western diagnostics or vice versa. Consistently pulse would find aggravation and inflammation in the gastrointestinal tract before *Helicobacter pylori* immunoglobulin levels were high in the blood, gastritis showed up on the CT scan, or abnormalities presented on endoscopy.

The use of Western diagnostics alongside Tibetan diagnostics was not contradictory to a traditional scope of practice in the minds of my mentors. As the *Four Medical Transmissions* states, "Any medical system that benefits the patient is considered Tibetan medicine" (cite). Thus, Tibetan doctors often take it upon themselves to study Western medical diagnostics and theory, and depending on whether they are in India or Tibet, learning some Ayurveda or Chinese medical theory and acupuncture, respectively. However, many senior physicians scolded young physicians and recently graduated medical students for their lack of diligence and perseverance in learning traditional diagnostics, especially pulse and urine. They would chastise them for relying on the Western medical lab results, images, EKG charts, cell cultures, and other test results. Undoubtedly, these high-tech methods were captivating for young Tibetans entering the medical field. Likewise, they provided quick assessments that did not have as steep or taxing a learning curve as learning pulse or urine analysis[70].

Since many Western medical diagnostics provide data points as numbers, it is easy to tell when a patient condition or function is changing, whereas Tibetan diagnostics are not as precise or specific. They rely on metaphorical language and inferences from

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[70] This is not to say that many Western medical diagnostics, particularly those from imaging technologies, do not have a similar nuance that one must learn to become proficient. Many experts build a lifetime of experience to be able to read subtlety from such diagnostic results. However, compared to Western medical diagnostics, Tibetan medical diagnostics require a greater amount of time to become proficient.

sensory perception, which I will argue later in this work allow for a tremendous amount of data to layer into a given diagnostic indication. However, this also means that there is minimal standardization in Tibetan medical diagnostics. One's approach and nuance will follow that of one's teacher, and many diagnoses will be highly similar. However, undoubtedly patient diagnostics will not be replicated identically. They cannot be. Doctors are different in their individual perceptual capacities and inferences. This is why Tibetan medicine values the expertise of older doctors, acknowledging the role of time and exposure to large volumes of patients and conditions in gaining experience and expertise. Thus Tibetan medicine compensates for its weakness in precision, detail and standardization in diagnostics by prioritizing the expertise of the eldest physicians and lineage, particularly the inheritance of transmission and tutelage from the most renowned lines of doctors.

As experience with my patients grew over the years, I imagined that pulse would play a greater role in diagnosis as I developed in my skill and clinical practice. However, in these initial years as a novice, I realized the symptomology was critical in providing the diagnosis.

"Alright, what's your diagnosis? Primary and secondary conditions?" Dr. Drukjal asked me with a playful smile on his face, knowing he was putting me on the spot for the first time with a patient diagnosis.

"Well," I said, "I want to investigate a urinary bladder infection due to the pain on urination and a possible yeast infection," I said.

He handed me a piece of paper with his diagnosis: *rlung-tsab* and *pho-tsey*[71] (gastritis). “Of course, we will run all the other diagnostics, but her case is pretty classic,” he said.

I realized I had not taken the gynecology course yet at school despite the month the previous winter (December 2011 to January 2012) when I had observed in the gynecology department during my Men-Tsee-Khang vacation before transferring to Sorig Loling August 2013. My lack of knowledge and practical experience clinically here were evident. Months later, looking back on this case, it does seem classic, but at the time, the symptoms were confusing to me with the other gastrointestinal conditions.

“Okay, what’s your prescription?” he asked.

I started fumbling through my notes of previous patients with similar conditions. I had not memorized the medicine chapters yet, and felt quite unprepared to perform this task. “Check it out in the *Zintik Yangtik*,” he said, handing me one commentarial text often referenced in clinical practice.

Aha, I thought, of course: it’s a quick reference. I didn’t even think of looking up the symptoms there. I realized to what degree this handbook has become a central reference guide for new doctors in the field. I looked up the respective chapters and made a prescription that addressed the various conditions she had and *nyépa* influences that I had assessed through the pulse and symptoms.

Upon handing my prescription to Dr. Drukjal, he said, “Okay, overall good, but we don’t have many of these medicines, like this medicine, or this one, or this one, or that

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[71] བློད་ཚབས་དང་ཡོ་ཚད།

one." He crossed off all the unavailable medicines and wrote other medicines in their places[72]. He added a medicinal wash for her urinary tract and yeast infection. "What do you think about this?" he said, handing me the new prescription.

"Looks good," I said.

"Alright, go ahead and submit it," he said.

I entered the information into the patient database, navigating the Chinese commands with his intern's assistance, and submitted the prescription in her patient file on the hospital computer network. She had gone to get her blood and urine taken, EKG, computer radiographs (CRs) and ultrasounds of her abdominal region[73].

When the test results came back, several of the links between Tibetan and Western medical diagnostics became apparent. Her urinary tract and yeast infection was consistent with the Tibetan medical diagnostics, especially with the early compounded *trak-tsab*. The heart *rlung* presented as a delayed heartbeat with a long QRS signal on the EKG, and an occasional heart arrhythmia. Chronic cholecystitis combined with the H. pylori infection matched the *béken mukpo* assessment. Her *rlung-tsab* would be recognized on the biomedical side as an enlarged cervix where the pelvic cavity was amassing fluid, the latter of which we also saw in her kidney pulse.

Often coldness in the kidneys provides an exacerbating condition for both *mazhuwa* and *mo-né*[74] (women's health) issues. Cold kidneys provide a synergistic

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[72] As Tibetan medicine expands to treat larger patient populations, availability of plant resources and substitutions for specimens that are scarce, endangered, and difficult to obtain have become increasingly common (Blaikie 2013; Blaikie et al. 2015). This has affected the availability of certain medicines.

[73] See Appendix 1 of this chapter for her biomedical diagnostic results.

[74] སྨོད།

complex with lower back problems, kidney disfunction, and formation of masses; they can contribute to the development of *rlung-tsab* from *trak-tsab*. Likewise, *trak-tsab* and *rlung-tsab* can occur in individual organs like the heart, lungs, liver, spleen, and gallbladder, as well as the kidneys. Each have distinct treatment trajectories as well. They call this category of disorders *tsab-ney*[75], where *tsab* itself means "intense" or "severe." This category of illness is named because "a women's menstrual cycle has spread in the body creating the resulting illness" (Jampa Drolkar 2011:26), and because it can exist in a women's body for many years, degrading the bodily constituents and creating unease in the body and mind, a class of diseases of great severity.

Likewise, because *mazhuwa* arises from the heavy and cool characteristics natural to the fluidity (water) and solidity (earth) dynamics of functional *béken* (Tobgye 2011:17), cool kidneys, which also have the fluidity dynamic, will exacerbate any *mazhuwa* condition and vice versa. Even though deterioration of the function of any of the organs can contribute to *mazhuwa*, those connected to *béken* are foremost influential (Tobgye 2011:18).

Here it is important to mention that "cool" refers to processes that are slower in development, often manifest with chronicity, and are related to organs and tissues related to the principles of solidity and fluidity. "Hot" illnesses are related to acute conditions of trauma, infection, inflammation, blood, burns, greater pain, and skin conditions. For example, a "hot" form of arthritis would often show high levels of C-reactive protein and erythrocyte sedimentation rates, both indicators of systemic inflammation in the body.

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[75] མཚབས་རྣད།

"Cold" arthritis would manifest slowly over long periods of time, be largely due to dietary or environmental conditions, and require treatments of long duration.

In these examples describing the conceptualization of "hot" and "cold" in the body, it is important to highlight that diagnostics in Tibetan medicine is a process and not a single event. The body is changing and shifting according to environmental, dietary, and behavioral inputs as well as therapeutic response. Diagnostics must track these adaptive responses to circumstances from which develop further function or dysfunction. The nervous and immune system demonstrate these processes well: their structural and functional complexity require inputs and exposures in order to operate, not only in concentrated periods such as childhood but also throughout adulthood (Changeux 1985; McDade & Worthman 1999; Worthman & Costello 2009:283). Context directs the inputs that such body systems must respond to — how to develop and function in specific conditions — and on a greater scale the ambient environment in which a child develops and the consequent health proclivities she or he develops. Thus, life circumstances are embodied (Grantham-McGregor et al 2008.; Stein et al 2008). This concept is seen clearly in the understanding of constitution in Tibetan medicine. One has a given form that is driven from one's parents reproductive seeds, karma, previous lives and so forth — we can think of this as the genetic blueprints. Then the gestational environment, postnatal circumstances and bioecocultural context of child development act upon this initial constitution to develop certain risks and proclivities of health challenges and strengths that will persist through the lifetime.

A given geographic region, microclimate, and local ecology will integrally affect how a specific population develops certain constitutions. Since Tibet is a rugged, windy, cold region exposed to abundant high, intense sun and cold frozen winters, it supports the development of a population who is rugged, tough, hot-blooded, with specific proclivities toward tripa disorders.

The interrelatedness of the *trak-tsab* and *rlung-tsab* symptoms with the kidney pulse can be seen through the function of the kidneys in Tibetan medicine. The kidneys contribute to the sequestration and expulsion of fluids and toxins in the body, promote sex drive and virility, and propagate bone growth. They are the base for the seeds of reproduction, the fluids of the body and all regenerative pathways (Tobgye 2011:229). Thus, an imbalance at the kidney level will manifest symptoms in all these related pathways.

Similar to the pathways for *mazhuwa*, *rlung-tsab* is also expected to form accretions and tumor- or cancer-like growths in the cervix especially (Jampa Drolkar 2011:11). The same would be expected from the biomedical corollary as well: the inflammation in my patient's pelvic cavity and her uterine enlargement can often result in leiomyomata, proliferations of smooth muscle that are benign neoplasms (cite).

Chapter conclusion

These diagnostics experiences, personally as a patient and later as an intern, demonstrated not only the mechanics of Tibetan medical diagnostics, but also reveal its strengths and weakness. It showed that embodied knowledge plays an integral role in the

unique qualities Tibetan medical diagnostics exhibits: early detection, insightful etiological understandings, astute recognition of progressions and prognoses, whole person diagnostics that recognizes the individualized nature of each condition, and nuanced understandings of subtle causal trajectories of illness from multitudes of influences. It also showed some of its trade-offs: it excels in accuracy but not specificity; prevention and prognosis but not precision; incisive insight by experts but limited standardization. Rich tapestries of interrelated data through metaphor but no exact data points. It requires time, repetition and exposure to diverse conditions and situations to build expertise, and thus relies on slow skill accumulation, the student-teacher relationship, lineage, and oral instructions. I realized that the tools for developing this embodied knowledge were clear yet daunting: rigorous and extensive memorization and recitation of poetic and metaphorical stanzas that inculcate bodily cues, train the senses and provide a framework for richly layering in clinical experience. This new pedagogical model became a window through which I began to understand the cultivation of embodied knowledge in Tibetan medicine.

Chapter III
Education Grounds:
Pedagogical foundations for cultivating embodied knowledge

Tutorials Transform: Proper Study Preparations

After arriving in Atlanta to begin my first semester at Emory in August 2009, Amchi Khenrab and I recommenced our tutorials via Skype. Each day, we spent one to two hours virtually "together," proceeding through the text, despite the time difference making late nights for him and early mornings for me. Amchi Khenrab moved methodically stanza-by-stanza through each chapter of the *Explanatory Transmission*, explaining key concepts, elaborating on points of contention, and describing clinical examples that illuminated the theory and practice. I was not aware of it at the time, but this would be the primary mode of classroom teaching throughout our courses at Men-Tsee-Khang when I entered as a formal student: moving line-by-line, explicating the meaning gradually through each section of the text.

After we completed twenty out of the thirty-one chapters in the Explanatory Tantra, Amchi Khenrab said to me, "I think we may not be using our time well. In reality, if you want to pass the medical entrance exam and enter here, you need to significantly improve your written Tibetan, memorize and study the grammar texts, and put all your effort into preparing for the entrance exam." I knew that I had two years before the medical entrance exam was administered in May 2011, and a very demanding doctoral course load, doctoral exam requirements, and a research grant application process to complete before then. Amchi Khenrab suggested I get an exam preparation tutor. Three months prior to my arrival at Emory, Tsepak Rigzin, a Tibetan literary scholar and

educator, was recruited to Emory. Since the Tibetan community tends to be small and well-connected, Amchi Khenrab knew of Tsepak's arrival and suggested I approach Tsepak for tutoring. Tsepak generously agreed to offer his time, despite his own heavy work load.

Gen Tsepak[76] held frequent conversation sessions with me in his office to improve my conversational Tibetan language skills. He had a tremendous ability to shift my language patterns: halting me at key moments, using playful examples to support memory retention of new phrases, and drilling idioms with me until they became natural. He assigned letters and short prose sections as homework for me to improve and craft my classical literary Tibetan writing skills. I had never met a teacher like him. His knowledge of the Tibetan language was not only vast, but he had a particular gift for catching my linguistic habits and deviant pronunciations on the spot—correcting them, re-framing ways to solidify corrections, and introducing new phrases to see the myriad ways to use the new phrases, terms and idioms. He also studied English language and literature closely. He was fascinated by what idioms were chosen for specific situations and how those depicted cultural orientations and expressions. He liked to map those into similar Tibetan forms or distinguish a Tibetan idiom from an English corollary.

Quickly I began to realize that my desire to study Tibetan medicine would demand grounding in many other areas of Tibetan scholastic life: grammar, handwriting, poetics, rhetoric and dialectics. I had already realized this when I studied Tibetan language at Tibet University in Lhasa. I enjoyed the emphasis on skill in poetics, the

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[76] The traditional respectful preface of "Gen" (དགེ་རྒན།, literally, "meritorious elder") means teacher.

beauty of one's handwriting and the art of one's speech and writing. I particularly liked the subfield of synonymies which supported creative poetry and dynamic play with logic. A mundane noun such as "the sun" could be "that which illuminates the day," "the source of heat and rays of light," and "the companion of the moon." Synonymies unveiled definitional characteristics, functions, and associations that were not readily apparent by the name of the noun itself to which it referred. This plays a significant role in the field of medicine where metaphor and synonymy elucidate organ function, clarify pathways of the *nyépas* (functional energetic systems), illustrate the relationship between form and function, and even enable the text to keep certain secrets from the casual reader. For example, several herbs and other medicinal ingredients have secret names as well as their official names. Oral instruction informs these nuances for the fortunate student who has been accepted by a legitimate teacher.

I understood how these various fields and trainings are areas one must master if one wants to become a learned person, an expert, that is, a *khépa*[77]. Historically, since most of Tibetan society was illiterate, being able to read, write and orate eloquently were seen as skills for a small subset of the elite. If a foreigner could also command such skills, it was all the more impressive. I was also aware of the five greater and five lesser knowledge fields spoken about in Tibetan scholastic circles as the domains one seeks to master in proper education. The five major fields of knowledge comprise inner science (Buddhist philosophy and practice), medicine, grammar, dialectics and craftsmanship; and the five minor fields comprise rhetoric, synonymies, poetry, performing arts and

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[77] མཁས་པ།

astrology. Amchi Khenrab had noted that when they select students for Men-Tsee-Khang, they look for a high level of literary Tibetan (spoken Tibetan would be assumed). This high level of literary Tibetan included skill in several of these major and minor fields — grammar, poetics and composition, rhetoric, synonymies and some in dialectics, as well as general knowledge about Buddhism, Tibetan culture, history and society[78]. I found out later the value of significant background in Buddhism and dialectics, particularly, when we began classes and participating in institutional activities.

That winter, the beginning of spring semester 2010, Amchi Khenrab arrived in Atlanta for his sabbatical. Geshe Lobsang Tenzin Negi, the director of the Emory-Tibet Partnership at Emory, spiritual head of North American branch of Drepung Loseling Monastery, and Emory Religion department faculty, is an important and influential figure in Tibetan-related studies and activities at Emory. He supported Amchi Khenrab spending his sabbatical at our institution with the support of a private foundation donation. Geshe Lobsang requested that Amchi Khenrab co-teach an undergraduate course on Tibetan medicine as part of their annual Religion and Healing course. I became his teaching assistant and translator.

During the semester of Amchi Khenrab's sabbatical at Emory, I was trying desperately to keep up with my regular doctoral class load, as well as assist him with teaching. I found myself navigating conflicting cultural expectations. As Amchi

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[78] Amchi Khenrab said that the entrance exam would not cover the dialectics or Buddhism in depth, but a basic understanding was critical, and they would look for students with significant background in these areas. Although not assessed in the entrance examination, the ideal student they sought would also have exposure to science, or be in the science stream. In fact, monastics who had studied and debated the Buddhist topics and lay students who had chosen the science stream in their education tract were the two most desired groups.

Khenrab's student, I felt pressure to continuously be available to him for any assistance he might need—getting groceries, transportation, social connections and so forth—beyond the basic assistance of the class he was teaching. I wanted Amchi Khenrab's stay in the U.S. to be productive and useful for him, enjoyable, and financially feasible. I also wanted his time at Emory to be beneficial for students and sponsoring faculty since they had contributed significant funds for his stay at Emory as a visiting scholar.

Amchi Khenrab had high hopes for not only improving his English, but also "studying science." After a week of settling into his homestay[79] near campus, he explained to me that, during his semester at Emory, he would need to study chemistry, biology, physics and basic Western medical pathology and diagnostics. I laughed. Did he understand the tremendous undertaking it was to even begin studying one of those subjects, let alone all of them? Did he realize what kind of education foundations he needed in mathematics, and basic science? It reminded me of many Westerners who go to India "to learn yoga" or "to learn how to meditate" and assume a two-week course or several months will be sufficient to do so. There is cross-cultural ignorance on both sides of the rigor and demand of such fields of knowledge.

"Okay, Gen-la," I said, one day when we had time to begin his science studies.

"Let's begin with the periodic table of elements."

"I don't need to learn that," he said. I smiled and explained how it formed the basis for understanding chemistry and would be required before we moved on to biology.

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[79] A homestay with a professor's family with young kids at his request since he said it would be nice to be with children since he will miss his own, and it will help with his language skills.

"No, no, let's just move on to compounds (*dzé*[80])," he said.

This is going to be challenging, I thought. How do I convey to him the epistemological foundations of Western science? Math and science had been part of my life as long as I can remember as I questioned how the world works and looked to science, particularly physics and its attendant mathematical language, for the answers. I did not know how to teach science without going to the very foundations. And I did not know how to convince him of the importance of these building blocks in understanding complex reality. It was as if he wanted to go straight to clinical chemistry and medical physiology and pathology, bypassing any basic science and math understandings required to understand these phenomena.

"The five elements and three *nyépa* can be understood with physics, chemistry and biology through their definitional characteristics," he said, referring to the five elements understood as principles of solidity, fluidity/adhesion, heat, motility, and empty volume for matter and energy to interact; as well as the three functional energetic systems that follow pathways in the body according to these principles (e.g., *rlung* following the principle of motility with the nervous and endocrine systems). "Once we have those, then we can proceed with research on Tibetan medicine." Again, it reminded me of Westerners learning meditation and assuming they can go right to the most complex meditation styles and concepts immediately without building the foundations and tools over time. He

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[80] རྫས།

seemed to bypass an understanding of attendant epistemologies to move forward with his training plan and research vision[81].

During that spring semester, I also wanted to spend as much time as I could learning from Amchi Khenrab. This was precious time and development in my own studies of Tibetan medicine. I felt torn between performing well in my doctoral classes, making use of opportunities to apprentice from him in seeing patients, and asking questions about parts of the text. As he presented material to the undergraduate class, I realized that my own understanding of the *Four Medical Transmissions*, even with the detailed line by line explanations, was limited. The concepts did not seem to stick well. This became apparent to me with greater clarity a year later when I began memorizing the text.

Preparing for the entrance exam

The next year was my second year in my Emory doctoral program. Sangey Tashi, a former translator with the Library of Tibetan Works and Archives, had come to Emory and was working as one of the science translators with the Emory Tibet Science Initiative. I approached him about tutoring me in preparation for the entrance exam and

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[81] Years later, this conundrum, teaching monastics science without any prior science or mathematics background, would be the major focus of the Emory-Tibet Partnership under a program called Emory Tibet Science Initiative (ETSI), which enacts the Dalai Lama's vision for integrating science into the monastic curriculum. The aim of this initiative is for scientists to better dialogue with monastics on the mind-science techniques of Buddhism and to allow monastics to gain greater insight into the nature of reality through education in science as well as more astutely participate in the mind-science discussions and collaborations. The program itself would stumble over these epistemological and education obstacles in its massive undertaking with tens of thousands of monks in South India, and hundreds of Western science professors. I was just beginning to explore some of these challenges in my interactions with Amchi Khenrab, and embarking on training in Tibetan medicine.

he gladly accepted, directing me quickly into a rigorous weekly schedule of improving my classical Tibetan written language skills[82].

Men-Tsee-Khang announced that the entrance examination would be held May 3rd through 6th 2011 and that applications would be accepted for examination seats from October through March. They would accept 25 new students by examination: "Twenty Tibetans from inside or outside Tibet, three of foreign or Himalayan origin, and two students whom are children of Men-Tsee-Khang staff." The school only admitted a new class every five years, for two consecutive years, such that a senior and junior class would go through the full five years of education together. This left a total of fifty students in the school at any given time. Some students had been waiting for years to take the examination.

Amchi Khenrab had described the possible entrance exam structures to me. The content was clear, but the types of questions and subjects within the topics could vary widely. I was able to get access to several past exams from which to study, and the assumption by most students taking the entrance exam was that the upcoming exam would have similar structure to past exams. The format of the entrance exam was expected to be a five-day exam of three hours of testing per day, including one day of

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[82] I knew that Gen Tsepak would gladly help me in any way he could, but he also had a full schedule of classes, research, and commitments with Drepung Loseling Monastery. Sangey Tashi accepted, and we began weekly meetings. He assigned various assignments for me to complete during the week, which he corrected and we reviewed together. He got me writing constantly in Tibetan, often sending random Tibetan cultural or historical questions during the week to incite a capacity for quick responses to overcome the anxiety of the difficulty in providing proper responses in literary Tibetan.

interviews[83], covering the topics of grammar, Buddhism, dialectics, and Tibetan cultural knowledge. In general, the exam format would look similar to the examination format experienced by many Tibetan students throughout their education in Tibetan society, both monastic and secular. The examination section on our knowledge of the grammar texts comprised questions on the basics of grammatical particles and phrases, how they should be used, and when they are improperly used.

The exam would ask a question about the use of a specific grammatical particle, and the examiner would expect a response where the student quotes from the classic grammatical texts. For example, a question would read, "In the manner of dividing Tibetan letters as male and female, which ones are male and which ones are female?"[84] The examinee was expected to quote directly from the grammar texts to respond to the question. For example, one quoted the root text, "Generally all thirty consonants are male; whereas the four vowels are female. [Though even among the consonants there are gendered subcategories. For example,] the five—*ka ca ta pa tsa*—are male; *kha cha tha pha tsha* are gender neutral (*ma-ning*); and *ga ja da ba dza wa zha za'a ya sha sa* are

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[83] The first two days would test Tibetan grammar, the next would be general Buddhism, cultural and society knowledge, including extensive coverage on the recent elections of the Tibetan government-in-exile. The fourth day would be essay responses to various questions. The essay questions may ask us to describe why we want to study Tibetan medicine, our future plans, general Buddhist concepts like compassion, cultural rituals, analysis of topics in the upcoming government-in-exile elections or otherwise. The fourth day would test translation of classic Buddhist stanzas into English. The final day we would be scheduled individually for interviews with the college faculty. The exam would comprise and be scored according to the following: (1) Content from the grammatical treatise by Thonmi Sambhota called Root Grammar in Thirty Verses (sum cu pa) 15%; (2) Grammatical content from the grammatical treatise called The Guide to Signs (rtags 'jug) 15%; (3) General knowledge (spyi'i shes bya) 25%; (4) Essay responses (rtsom yig) 25%; (5) English (dbyin yig) 15%; (6) Interview (ngag rtsal rgyugs) 5%; (7) Science (tshan rig) 5%. The latter 5% for science was considered extra points gained from one's science background, such as being a science stream student in high school or studying for a science major in college.

[84] སྒྲིར་བོད་ཀྱི་ཡི་གེ་ཕོ་མོ་གཉིས་སུ་ཕྱེ་ན་གང་དག་ཕོ་དང་གང་དག་མོ་ཡིན། (MTK Batch 7 February 17, 2003 Exam)

female. *Nga nya na ma* are extremely female (*shin tu mo*). *Ra, la, ha* are *mo-sham*[85] female. *A* is without the terminology of male or female. Extremely female and female *mo-sham* are subsumed within the female category for nineteen female letters, from which the ten post-particles are taken. From those ten post-particle letters, five are prefix letters."[86] One could respond in prose[87], but the superiority of the directly quoted response from the classical grammar text shows that the student not only knows the particles, but knows exactly how it is formally presented in the root text. If one can remember the exact root stanzas, one is assumed to have a greater capacity to decipher nuances in how the consonants are presented in case there is doubt or points of contention. Thus, directly quoting the root text would receive higher points scored on the exam than simply a correct explanation of the grammar logic. This was a valued form of knowledge and response carried into my entire medical education as well.

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[85] Translates as "barren woman."

[86] The passage continues, "Those also have male, female, gender neutral, extreme female, and mo-sham female particle categories," and so forth. The full passage reads: ༄ ད་ནི་རྟགས་ཀྱི་འཇུག་པ་ཡི། །གཞུང་དོན་མདོར་བསྡུས་འཆད་པ་ལ། །ཕྱིར་བཏང་གསལ་བྱེད་སུམ་ཅུ་པོ། །དབྱུང་བཞི་མོ་ཡིན་གསལ་བྱེད་ཀྱང་། །ཀ་ཅ་ཏ་པ་ཙ་ལྟ་པོ། །ཁ་ཆ་ཐ་ཕ་ཚ་མ་ནིང་། །ག་ཇ་ད་བ་ཛ་ཝ་ཞ། །ཟ་འ་ཡ་ཤ་ས་ནི་མོ། །ང་ཉ་ན་མ་ཤིན་ཏུ་མོ། །ར་ལ་ཧ་ནི་མོ་གཤམ་མོ། །ཨ་ནི་བཛ་སྤྱོད་མང་པོ་ལས། །ཕོ་མོའི་ཐ་སྙད་མེད་པར་གསུངས།། ༄ ཤིན་ཏུ་མོ་དང་མོ་གཤམ་གཉིས། །མོ་ཡིག་ནང་དུ་བསྡུས་བྱས་ཏེ། །མོ་ཡི་ཡི་གེ་བཅུ་དགུ་ལས། །རྗེས་འཇུག་ཡི་གེ་བཅུ་དབྱུང་བྱ།། ༄ རྗེས་འཇུག་བཅུ་པོ་དེ་ཉིད་ལས། །སྔོན་འཇུག་ཡི་གེ་ལྔ་དབྱུང་བྱ། །དེ་ཡང་ཕོ་མོ་མ་ནིང་དང་། །ཤིན་ཏུ་མོ་དང་བཞི་རུ་དབྱེ། །སྔོན་འཇུག་བ་ནི་ཕོ་ཡིག་ཡིན། །ག་དང་ད་གཉིས་མ་ནིང་དང་། །འ་ནི་མོ་དང་མ་ཡིག་ནི། །ཤིན་ཏུ་མོ་རུ་ཀུན་གྱིས་བཞེད། །སྔོན་རྗེས་མིང་གཞི་གང་ཡིན་ཡང་། །ཕོ་མོ་སོགས་ཀྱི་ཁྱད་པར་ནི། །སླ་གདངས་དྲག་ལ་གྲིམ་པ་པོ། །གྲིམ་སློད་རན་པ་མ་ནིང་ཡིན། །ཞན་ལ་སློད་པ་མོ་ཡིག་དང་། །དེ་ལས་ཀྱང་སློད་ཤིན་ཏུ་མོ། །ཧ་ཅང་སློད་ཞན་མོ་གཤམ་སྟེ། །མི་སྣང་དཔེར་བྱས་རྣམ་གཞག་མཛད།། ༄ སྔོན་འཇུག་འཇུག་ཚུལ་རྒྱས་བཤད་ལ། །དེ་དག་རེ་རེའང་བཞིར་དབྱེ་སྟེ། །གང་གིས་འཇུག་བྱེད་གང་ལ་འཇུག །ཇི་ལྟར་འཇུག་བྱེད་ཅིའི་ཕྱིར་འཇུག། ༄ (From https://bo.wikipedia.org/wiki/སུམ་རྟགས་ཀྱི་ཚིག་དོན་མདོར་བསྡུས་པ་བློ་གསར་མགུལ་རྒྱན། Find actual citation.)

[87] Such as: "From the thirty consonants (lit. clarifying letters, gsal byed) ka and so forth, the male particles are ka, ca, pa, and ta; the female letters are ga, ja, ba, da, tsa tsha, dza, wa, zha, za, ‘a, ya, sha and sa; the neuter letters are kha, cha, pha, and tha; the extremely female (shin tu mo) are nga, nya, ma and na; and the mo-sham (lit. barren woman) letters are ra, la, ha and a." གསལ་བྱེད་ཀ་སོགས་སུམ་ཅུ་ལ་ཕོ་མོ་མ་ནིང་གི་དབྱེ་བ་རྣམས་ནི། ཕོ་རྣམས་ལ་ཀ་ཅ་པ་ཏ་དང་། མོ་རྣམས་ལ་ག་ཇ་བ་ད་ཙ་ཚ,ཛ་ཝ་ཞ་ཟ་འ་ཡ་ཤ་ས། མ་ནིང་རྣམས་ལ་ཁ་ཆ་ཕ་ཐ། ཤིན་ཏུ་མོ་རྣམས་ལ་ང་ཉ་མ་ན་དང་། མོ་གཤམ་རྣམས་ལ་ར་ལ་ཧ་ཨ་བཅས་ཡིན།།

The general Tibetan cultural knowledge section seemed like a bottomless pit of possibilities. It seemed to value a well-rounded individual of Tibetan society with understandings of religious, political and cultural knowledge and practices. This part of the examination seemed extremely difficult to prepare, except by reading widely, staying abreast of current events, and hoping that my studies of Tibetan history, culture and Buddhism might be sufficient to give a reasonable answer to whatever was asked of me. An example of a question might be: "How did the first king of Tibet Nyatri Tsenpo receive his name?" or "What was the significance of the treatise referred to as *The Mirror of Poetry* and who was it written by?"[88] We might be asked, "Which is the red-black protector?" or "Describe the difference between luck, merit, and karma[89]."

The composition section requested responses in various classical composition styles—prose, poetry, and so forth. Luckily, I had some familiarity with these styles from my poetry class at Tibet University where we went through many dozens of poetry types in the field of Tibetan poetics.

Entrance Exam

I arrived in Dharamsala on April 28, a week before the actual exam, so that I could prepare and recover from jet lag. The test days proceeded with the expected subject matter, the first two days testing our knowledge of the grammar texts, the third day on general Buddhism, culture and society, the fourth on essay composition and poetry, and

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[88] ། བོད་ཀྱི་རྒྱལ་པོ་ཐོག་མ་གཉའ་ཁྲི་བཙན་པོ་ཡིན། ། སྒྲན་དག་ལེ་ལོང་མ་ཞེས་བའི་བསྟན་བཅོས་དེ་རྩོམ་མཁན་ས་པཎ་ཡིན།

[89] ལུང་རྟ་དང་། བསོད་ནམས་ལས་དང་བཅས།

Tibetan-English translation and English knowledge generally, and the final day of individually scheduled interviews. Each day we had two sessions of 90-minute examinations each. I was surprised at the number of examinees in the various halls and classrooms. I knew that this was a sought-after opportunity among Tibetans, but to see the number of potential students arrive for the exam was impressive. It seemed that only the brightest students with excellent Tibetan language skills considered applying for Men-Tsee-Khang[90].

On the first day of the entrance exam, as all the students filed into the examination hall, I noticed one other examinee who looked like a foreigner. She was short with full accentuated curves, and had dark hair and eyes, an olive complexion, gracefully dramatic movements and beautiful features. She smiled widely. She seemed almost Kashmiri, but had more of a Persian or eastern European appearance. I could feel the competitive edge rising inside me. Where was she from? How had she been able to study Tibetan so well to be able to take the entrance examination? Who supported her in her preparation? I knew that there was only one foreigner spot available, and I felt determined to do well on the exam.

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[90] Five years earlier, I remembered Lhamo, a Tibetan student from Nepal, who had excelled in all her classes at Sarah College. When she decided to apply to Men-Tsee-Khang, the entire Sarah College campus was rooting for her. Extra support was given to her in tutoring from teachers and classmates for the specific subjects. She seemed nervous and excited by the possible opportunity. When she gained entrance, there was great enthusiasm and celebration across the entire campus. Two years later, I heard that Lhamo had to leave Men-Tsee-Khang to attend to family concerns at home in Nepal. Many said that the academic rigor at Men-Tsee-Khang was too hard for her. Some said it was the degree of memorization and performance on examination. Regardless, Men-Tsee-Khang was regarded as a difficult and prestigious place to gain entrance. Some teachers and students had told me that many students from Chakpori will stay a year or two at Chakpori since it is easier to gain entrance and then seek entrance at Men-Tsee-Khang because the education at the latter is seen as much superior. In fact, one of my classmates, Lhargey Sangpo had done just that. He had already completed the first two years of Tibetan medical education at Chakpori, and felt it well worth his time to repeat those two years of study if able to be a Men-Tsee-Khang student.

After the first two days of the examination, I went back to the room I was renting adjacent to the Men-Tsee-Khang at a place called Ratöe. I reviewed my grammar texts in the morning to make sure that I remembered all the particle associations well, and tried to read up on Tibetan history, Buddhist logic, political organization and cultural symbology in the afternoons. I knew we could be asked anything on the next examination day. As I left my room to walk up to town for an early evening study break and dinner, I met the other foreigner on the road. We almost bumped into each other. "Wow, hi!" she said, in English, "You are pretty!" I was taken aback. I never thought of myself as pretty and was surprised that this was her first comment.

"Uh. Oh, thank you. You are….very pretty too," I responded back to her, not sure what to say, but responding candidly of her dramatic and elegant eastern European lines, wide brown eyes, and long thick flowing brown hair.

"Where are you from?" I asked.

"I'm Armenian," she responded. "But I live in Moscow now. My family moved there from Georgia when I was young. But I'm actually Georgian," she qualified, clearly uncomfortable with the association of being Russian.

"Ah, nice," I said, "There is a large Armenian population in the U.S. Strong culture," I said.

"Yes," she laughed, "Almost too strong."

"Where did you learn Tibetan?" I asked her, unable to contain my curiosity.

"I don't know any Tibetan!" she exclaimed with an almost exasperated laugh, "I just sit in those examination rooms and write whatever comes to my head, then I turn the

paper in," she explained lightly. "I have Russian government support and will have a letter from the Dalai Lama to get in, so the examination is just a formality," she continued.

"Wow. Really??" I said, both in disbelief and relief. "Won't that be hard when you start classes?"

"Not really," she said. "I have a year to prepare. I'll be taking classes at the Library and will have a language tutor to help."

"That's amazing," I said, "I have been studying Tibetan for more than ten years, and I am still not sure if I can pass the exam, let alone do well in the studies."

I reflected on the intense preparation I had undergone the past year and prior intensity of study and exposure to Tibetan language. Even with my experience, I was nervous about the rigorous academic standards, literary skill and memorization loads required by Men-Tsee-Khang.

"I'm sure you will be fine," she said.

"Well, I'm happy to give you any of the materials I have for learning Tibetan," I offered, amazed by the challenge ahead of her.

"Wow, really??" she said, with a look of surprise. "In Russia, if we were both sitting for the same exam or opportunity, even if it was not competitive, no one would share resources. People hold resources close to them and do not share."

"Oh really?" I said, taken aback. "I grew up where we just share educational resources. It's just information and helps everyone by sharing."

"Thank you. That is very kind of you," she said.

Inga and I quickly became close friends.

The subsequent days of examination were exhausting. I was surprised at the degree of composition writing. “There were even two sections where we had to write a poem as a commentary response to two prose phrases,” I wrote Sangey Tashi in an email the day the last exam was complete. I was both surprised by the rigor of the exam, but also delighted that I could get through it. “I feel good about what I wrote,” I told him, “At least I felt that I was able to write a reasonable answer to every exam question.”

Over the previous months, I had also been crafting my response for a question asking about our motivation for becoming a Tibetan doctor. I knew this would show up somewhere during the exam. I prepared the Tibetan vocabulary for my initial aspirations to be an aerospace medical doctor, growing up in South Korea as the daughter of an orthopedic surgeon and encountering Tibetan medicine as a physics cum pre-med student impressed with the extent of mind-body knowledge and the integration of Buddhism in the medical system[91].

The final day seemed like a great relief. We were scheduled to be interviewed by a small group of faculty from the college. “Tsering Tsomo!” they called my colloquial Tibetan name to enter the room at my arranged time. The name had been used by my Tibetan friends to refer to me for many years and had become normal by now. “Where are you from?” they asked. “United States, Colorado—in the middle of the country with lots of snow mountains,” I explained. “Have you been hiking before?” they asked.

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[91] Many of these terms required advanced preparation for creating terms that might not readily be in classical Tibetan.

"Yes," I laughed, a bit surprised by the question, "Where I am from there are many mountains so we go hiking often."

"Show us," they said, "Walk around that desk and around this classroom." I was surprised by the request and started walking around the room. "Now, step up on that step," they said, pointing to a small stool. I climbed onto the step and then back down. "Where would you get water?" they asked.

"I'd look for a water source near a spring or highest up on a mountain without likelihood of refuse from humans or grazing animals contaminating the water," I responded. I was amused by the requests, and a bit surprised.

"Okay, that's it. The interview is done," they said. They did not even ask me why I wanted to study Tibetan medicine. I realized that this question was covered by the written portion of the examination but I expected it at least to be repeated in the interview as well. The interview was surprisingly short.

On May 12, 2011, we received our results. I did not even ask Inga how she scored on the exam. She would be admitted through the Dalai Lama's letter of support regardless so her score did not matter.

I remember being in the office of Amchi Jamyang Gyatso, the Director of Literary Research and Publications and the nephew of Amchi Khenrab Gyamtso, the Vice

Principal and my primary teacher up to that point. He had been asked to tutor me for a few days leading up to the exam.[92]

"Stand up!" Amchi Khenrab exclaimed as he walked into Amchi Jamyang's office.

I was surprised and a little nervous. Amchi Khenrab was known for having a short temper and being stern. I did not know if he was about to scold me or order me out of the room.

"Give me a hug!" he exclaimed, as he grabbed me and squeezed me with both arms.

I was in disbelief and caught off guard. This was very unusual behavior for him, let alone for most Tibetans, and certainly not culturally common.

"You passed!" he exclaimed.

"Really?!" I said, now understanding his explosion of enthusiasm.

"Just barely—55.3%, but with the 5% added for your science background, you received 60.3%—very close to where many of our Tibetan students scored." He was clearly very pleased with my performance, and was revealing what had previously been his significant doubt and concern that I would even have passed. "Welcome to Men-Tsee-Khang!" he said, "You are now *really* one of our students."

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[92] Amchi Jamyang Gyatso and I enjoyed conversation together and he was supportive of my admission. He frequently spoke about how Tibetan students enter the college too young with little knowledge of the value of Tibetan medicine and the educational opportunity to study it. They have little life experience, he said, to make them earnest students. He knew that I was almost a decade older than the other students and had chosen the path carefully after much thought and contemplation. He also recognized the benefit of having a Westerner traditionally trained in Tibetan medicine in order to provide strong bridges with scientists and biomedical doctors in the West.

Preliminary Year & Introduction to Memorization

Several weeks later, we convened our first class of the preparatory year before official classes began the following March of 2012. I was told that the preliminary year was optional since they would not yet be teaching our root Tibetan medical text, the *Four Medical Transmissions*.

During our preliminary year, we were strongly encouraged to at least begin memorization of the six chapters of the *Root Transmission*. Every afternoon Inga and I wandered down the path through the Ponderosa pine and white oak woodlands that extended up and above Men-Tsee-Khang campus. A small paved footpath wound through the pine thatch forest floor and eventually made its way to McLeod Ganj, the bustling center of town with its two busy, parallel main streets. She and I would find a quiet area within eyesight of each other and engage in our sessions of "uploading," a term we used for reciting a half page of text several hundred times to commit it to memory so it could subsequently be recited continually from memory. I remember Ani Kelsang Wangmo's advice to me about memorization. As the first female Westerner to go through the full curriculum at the Institute of Buddhist Dialectics, and as a Western nun, she was a role model and inspiration. "It's easy," she said, "Much easier than you might imagine. Just make sure that it is the first thing you do when you wake up and before you go to bed, and recite for at least one hour per session. I would say the estimate of reciting 500 times per section of text before it is solid in your memory is a good approximation. I like to start a new section at night, and then over the night it seems to solidify in my memory

and then it is mostly just reciting it from memory when I wake up in the morning." One hour in the morning and one hour in the evening, at least, I thought.

At first, it seemed unlikely one would need the full five hundred repetitions. After several dozen, I felt like I could recite it from memory, although with strained effort to recall. And after one hundred times, it seemed easier. However, as my time spent memorizing the sections of the text progressed, I realized that the idea that it takes five hundred repetitions before it is solid in one's memory is quite true.

In fact, it seemed there were various aspects of memory occurring, various parts of memory programming happening. On one level, there seemed to be some form of muscle memory patterning occurring. I found that sometimes my mouth "knew" the text before my mind knew the text. This made sense since I had observed many *amchis* recalling a section of text, prompted by some word or part of a stanza, reciting several stanzas, then acting as if the section of text appeared in the air. As they looked up at the imaginary text hovering in the air, they seemed to analyze the meaning on its pages to provide an explanation. It was as if the conceptual memory occurred after the muscle memory. I was fascinated. I loved the process of it, and could not believe that we were able to do it.

This must be an ancient technology of humankind that we are tapping into, I thought. We have been passing along oral history and narratives for millennia, much longer than we have ever had written word.[93] Our brains and our neural infrastructure

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[93] The field of oral history, however, tends to focus on the contemporary developments of oral history (Thompson 2007).

must know how to do this, and we are simply tapping into a capacity that has evolved over many thousands of years.

I was in for an intense academic year when I returned to Emory for my last year before fieldwork and during the months that my Men-Tsee-Khang classmates were completing the preparatory "year" classes (of which I had completed four of the seven months)[94]. I was taking the "boot camp" neuroscience core, a full semester load for entering neuroscience doctoral students. I was the only anthropology student taking the course series. I was also sitting in on the graduate human biology course in our department. To me these classes seemed seamless with what I was pursuing in Tibetan medicine: understanding the body in all its facets and from all its perspectives. Likewise, my Tibetan mentors saw a rigorous understanding of science as important training for a Tibetan medical physician, and explicitly encouraged such pursuits by students, faculty and staff. Neuroscience seemed the most likely place for bridges between Tibetan medicine and Western science to be made.

At the time, however, I had no idea that this would be such a generative area for what my actual dissertation would become. I knew that I was investigating embodied knowledge, but the imprinting from memory to body, the full sensory experience generated through the metaphors of the text and the experience it generated through these visualizations was not anywhere in my mind when I was taking the neuroscience classes. I was looking at where physiology of the body from the Western perspective meets that

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[94] Although called "a preparatory year" it only lasted May to December 2010. My classmates recorded and emailed recordings of the classes for the three months that I missed.

from the Tibetan perspective and how this could allow us to understand insights into how the body works and generates health and healing.

One of my cogent memories was meeting Barbara Fredrickson when I picked her and Richard Davidson up from the Atlanta airport for a Mind & Life conference at Emory. “Richie, what do you think about exploring vagal tone as an intersection for how Tibetan medicine sees the pathways of *rlung*?” I asked him, referring to the functional integrity of the vagal nerve that modulates emotional response and integrates with various physiological responses in the body. I knew that he was familiar with the concept of *rlung,* and I wanted Barbara to be exposed to the possibility that her research focus on vagal tone was an opening to a much greater dialogue between Western and Tibetan traditions. “I think that is a fantastic idea,” he said, smiling widely at me. Barbara asked me about *rlung* and I began to explain some of the basic concepts of its pathways, association with mind and so forth. “That sounds like exactly what we are looking at in my research, except that we are not tracing it to other pathways in the body just focusing on the vagal nerve itself,” she said. “Yes,” I said, “I’d love to bring the rest of the body into the conversation.”

At the same time as I was dissecting the brain, learning neural and brain anatomy and physiology, and immersing in neuroscience, I was also trying desperately to keep up on my daily quota of memorization, my “uploads.” Without an hour in the morning and an hour in the evening, I felt anxious that the parts I had put hundreds of hours in to memorize already were slipping away, and I was not making the necessary progress to be able to keep up with my peers at Men-Tsee-Khang once I returned. I felt awkward about

the recitation cadence, and I did not feel comfortable creating my own "melody." Before I left Men-Tsee-Khang that summer to return to Emory, I asked for assistance from one of my mentors, assigned to me by Amchi Khenrab, with whom I was assisting in recording the life story of his renowned uncle Amchi Yeshi Dhonden, that summer. He hesitantly allowed me to record him reciting the first chapter of the *Root Transmission*. Playing it back through headphones, I tried to maintain a similar melody.

I also wanted a recording for the other chapters so I could engrain the melody in my head. I approached another *amchi* who had came to Emory to participate in a collaboration between one of the top drug discovery labs at Emory, that of Raymond Schinazi, and the *amchi's* home institution, Varanasi Central University for Tibetan Studies (CUTS).[95] He was hesitant to make a recording for me at first, citing differences between his institution and Men-Tsee-Khang, but eventually he let me record him reciting the *Root Transmission* and a good portion of the *Explanatory Transmission*. I was delighted. I listened to the recording often, focusing on the rhythm and cadence, to see how much I could keep up the cadence and stanzas from memory.

As time progressed with my memorization and recitation, I developed my own cadence and rhythm. I remembered speaking to the first foreigner to graduate from Men-Tsee-Khang, Ogawa, a Japanese national. He had been able to recite three of the four transmissions from memory upon graduation, which is considered graduating with high honors in the Tibetan medical world. He said that memorization was very difficult for

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[95] Although Amchi Tashi Dawa had minimal science background, he was a talented young *amchi* and instructor at CUTS, and was selected by the CUTS provost as their top candidate to learn the laboratory techniques and bring them back to Varanasi.

him. He told me that he spent "most of his five years at Men-Tsee-Khang focusing on memorization" (Ogawa 2011). When walking up the hill to LungTa, the Japanese restaurant where he had dinner almost every day, he described to me that he would recite on the way up, and on the way down, at lunch, in the morning, and in the evening—basically any spare time he had between classes, meals and sleeping. He said that the text came to his mind in the rhythm of a rap. He was a talented singer and rap artist, and this was a natural fit to him.

Though Ogawa gained strong results in his memorization by using the rap melodies[96], his extensive hours of practice took a toll. The *Four Medical Transmissions* describes excessive verbal activity as a condition for increasing *rlung* in the body, and was something I noticed often in my memorization periods. Since the mind rides on *rlung,* like a rider on a horse, the mind can feel agitated and unstable with high *rlung*. Ogawa said he felt exhausted and intensely mentally unbalanced, so much so that he had to take a year break from Men-Tsee-Khang three years into his study. His time away from Men-Tsee-Khang, however, was not a complete break. He had a break from the classes and the required performances of written and oral exams, but he continued to memorize and recite the text.

In a given class of two to three dozen students, often only one or two students will attempt to perform the recitation of the three out of four transmissions. In Men-Tsee-

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[96] Recent research has shown that singing can facilitate short-term paired-associate verbatim phrase learning (Ludke, Ferreira & Overy 2014). A young British doctor at Glenfield Hospital in Leicester, Tapas Mukherjee, found that 55 percent of nurses and doctors were not following hospital guidelines on asthma management, and 38 percent were not even aware of the guidelines. He developed a video singing the guidelines into memorable lines and released it on YouTube (Murphy Paul 2013). After two months nearly all doctors and nurses were aware of guidelines, and compliance with guidelines had increased dramatically, he reported to the European Respiratory Society (Mukherjee 2013).

Khang history in exile, no one has performed recitation of the entire four transmissions[97]. Ogawa being a foreigner, albeit Japanese, it was considered quite remarkable that he was able to memorize and recite the three out of four transmissions. He said that when he began his graduation recitation delivery, in the rhythm of a rap, the faculty tracking his progress in the text began to laugh. He said they seemed to be in disbelief that he was actually reciting it in this way, as if it was a joke. However, when he continued with the same rhythm and cadence, they began trying to follow along in the text. When he stopped, there was great applause, and several of the *amchi* proctors asked him to do it again so they could make sure he was properly reciting all the words — they had not been able to follow a single line the first round, which took several hours, and wanted to confirm that he indeed was reciting verbatim. The rhythm must have been too unfamiliar for them, he said, but he had little choice but to do it in that rhythm because that is what came to him.

Inga and I laughed years later when we realized that each of us had come up with our own rhythm as well. This was less so for the *Four Medical Transmissions* since we often recited the *Four Medical Transmissions* together in class and as an institute, and so had approximated similar recitation rhythms. However, for Khenrab Norbu's medicinal plant enumeration text with its highly varied stanza length and syllable number, and many words that derive from the ancient Tibetan Shang Shung language, Sanskrit and other sources, we could not help but develop an idiosyncratic rhythm to properly

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[97] The entire four transmissions have been recited several times in recent history in Tibet though — at Sorig Loling in May 2016, three students in Golok in 2014, and a handful of others years prior.

memorize the idiosyncratic stanzas, phrases and words. When I was practicing my full recitation for Gen Jamyang Gyatso before my first oral exam at Men-Tsee-Khang at the end of our first year, he also started chuckling. “Sorry, Gen-la, I know it sounds funny, but that’s the only way I can memorize it, with this kind of rhythm of almost singing it,” I said.

“No, no, it’s great. It works and that is most important. Everyone has their own cadence. It is just quite different than what Tibetans come up with,” he responded.

I was intrigued that we as foreigners came up with different tunes, rhythms and cadences compared to our Tibetan peers. Whenever I tried to explain to my Tibetan classmates that in the US and much of the West, we do not have educational systems with extensive memorization, they would insist that they also did not have extensive memorization or recitation akin to what we do at Men-Tsee-Khang in their education prior to entering the medical institute either. This might be technically true in terms of the kind of extensive memorization MTK requires; but culturally and societally, memorization seemed pervasive. I saw young Tibetans, children of Men-Tsee-Khang staff, reciting Tibetan and English paragraphs for their primary and secondary education classes around the Men-Tsee-Khang compound. Additionally, with my experience in the Tibetan community-in-exile for over ten years, I observed the extent to which reciting prayers played a major role in the daily routine of almost every Tibetan, whether in their family house, boarding home at school, or in classes themselves. Likewise, reciting prayers has a pervasive societal role—conducted at almost any religious or social function, as well as major teachings of His Holiness the Dalai Lama or other high

teachers. This aspect of their experience seemed to have become invisible for them as an assumed experience for all. The rhythms and cadence of prayers and other chants were consistently led by chant masters or monastics in the crowd, and the tone was set for all others to follow. The range of rhythm and cadence types was fairly narrow. The entraining of this kind of melody seemed to become a cultural characteristic that emerged "naturally" when Tibetan students recited the texts. However, as foreigners, we did not have this mental and aural-to-oral patterning, so our melodies were often quite distinct from our Tibetan counterparts.

As time progressed, I found myself moving toward the cadence patterns to which I was exposed at Men-Tsee-Khang. They were beautiful to my ear, and somehow seemed more appropriate for the texts. Later I would learn that imitating the rhythm and cadence of one's teacher for one's practice text is an aspect of carrying on the lineage, whether in medicine or Buddhism. Retaining a teacher's cadence in reciting the text carries a certain potency similar to an empowerment or transmission, the attendant for my teacher explained to me (Somanānda 2015).

Initial class experiences

When I returned to Men-Tsee-Khang after my final coursework and examination year at Emory, I arrived six weeks late due to the graduate course demands at Emory and the offset of the academic calendar years.[98] Knowing that my first exam at Men-Tsee-Khang likely would not go well, I prepared myself mentally for this challenge. Although

[98] Men-Tsee-Khang starts in March and runs through December; and Emory starts in August and ends in May.

Inga and a few of my other classmates had been sending me recordings from each class and updating me on the progress through the text, I was still surprised at the awkward approach of different classes teaching distinct sections of the *Four Medical Transmissions*. The first major exam was an odd assortment of chapters, many of which I had not started memorizing since I approached my memorization sequentially by chapter in the *Four Medical Transmissions*, like other students.[99] Since many of my classmates were aware of what would be on the first exam, many of them adjusted their daily memorization load so that they targeted the content of the chapters that would be on the first exam, leaving earlier chapters that would not be on the exam on hold for later.

I arrived with three weeks to spare before the first exam and felt panicked. The memorization itself was difficult for me, and I did not have a sense of what the questions on the first exam would even be like. Many of my classmates and students from the upper class explained that the text proceeds through *sab-jé*[100], or "outline" form, which we would write into our texts using multicolored pens to enact the identical color scheme for the various declinations of headings from the "master outline" for each chapter and section. The master outline did not exist in the document form as an outline, but was assumed from the subjects enumerated in each *Four Medical Transmissions* section itself and the headings elaborated by the commentarial literature and scholars.

The exam questions drew from the outline headings and requires one to write the root text verbatim, from memory, on the exam paper and then explain it, drawing from

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[99] See Appendix for the contents of *Four Medical Transmissions*; and see Introduction for table of annual progression through the *Four Medical Transmissions* content and other subject matter.

[100] སྡོམ་རྒྱུད།

the major commentaries with which we should be familiar as well. This seemed easy enough to me in theory; however, the trick was to be able to memorize and recall the specific section based on the heading title or content, reproduce the stanzas verbatim on the exam sheet and then explain using commentarial analysis, or at least privileging commentarial interpretations over one's own understanding. Verbatim citing of renowned commentaries along with producing the exact stanzas gained the greatest points on the exam. Upper class students noted that some teachers differed in what they preferred on the exam, and it was hard to know how the grader would think. Both Men-Tsee-Khang and the other major Tibetan medical school in India, located at Sarnath, often hired outside doctors, or each other, to write exam questions after the institution provided a summary of what teachers covered in each class. However, the exam graders were from the home institution itself. Some teachers, usually the younger generation, preferred original thought which demonstrated that the student understood the content. Other teachers, often of the older generation, preferred that the student demonstrate they were aware of and could cite key commentaries and points of contention between commentaries, much more than original thought or understanding. Demonstrating a little bit of each was the safest approach, with more emphasis on the latter than the former.

Needless to say, I almost completely failed the first exam, less because I did not understand the content that was tested, but more because I could not produce the exact root stanzas or quote the commentarial interpretations from memory. After that first exam, I resolved to make sure every subsequent exam went well. I memorized the *Four Medical Transmissions* in every spare moment, rising at first morning light and staying

up late into the evening. I was surprised that my Tibetan roommates seemed to be able to rise early and go to bed late with minimal impact on their memorization capacity. I found that without a solid night of sleep, my efforts to memorize were futile.

I recognized that reciting the *Four Medical Transmissions* and stanzas from the commentaries, in many ways, was — or would be — our primary credential as Tibetan medical doctors. To show that we had done the proper study and training, we needed to engage in inserting memorized stanzas into conversation with other *amchis* or in response to certain questions in the clinic. It demonstrated the rigor of our learning and provided insight into almost any aspect of clinical practice. This capacity was much harder for me than I wanted to admit. I could recite from the beginning of a chapter, but to jump in midway was much more difficult. If someone prompted me with the beginning words of the stanza, I might be able to finish the stanza and move on to the next. I am still building the capacity to be able to do this; and more than two years after graduating from Sorig Loling and passing all my oral and written examinations, I still recite the *Four Medical Transmissions* and other texts at least an hour daily.

The Four Medical Transmissions *as a Text*

The *Four Medical Transmissions* itself is arranged into four sections, presumably self-sufficient texts in their own right, but practically approached as a cohesive whole. The first part, called the *Root Transmission*, comprises six chapters and is considered a pithy summary of all Tibetan medical theory and practice. The second part, called the *Explanatory Transmission,* has thirty-one chapters and contains the theoretical

foundations of Tibetan medicine. I was told by Gen Yeshe Gelek that when we understood the *Explanatory Transmission*, we would be able to teach Tibetan medicine to anyone because it is the only section presenting the theoretical framework systematically and rigorously, yet still concisely. The third section is called the *Oral Instructions Transmission* and comprises the great majority of chapters and pages of the entire *Four Medical Transmissions*. There are 96 chapters divided into fifteen compendia of illness categories such as *Nyépas*, Hot Illnesses, Internal Illness, Upper Body, and so forth. Each chapter details the causes and condition of the illness, its general and specific diagnostics, types and locations of the illness and treatment modalities and instructions. It is considered the encyclopedia of illness diagnostics and treatment for Tibetan medicine. The fourth and final section is called the *Subsequent Transmission* and includes detailed chapters on pulse and urine analysis and then elaborate sections on the different forms of medicine and their ingredients. It also has sections on each external therapeutic modality such as moxabustion, venesection, compresses, water therapies, surgical techniques and so forth.

Although we memorized the entirety of the *Root* and *Explanatory Transmissions*, and most of the *Subsequent Transmission*, we only memorized parts of the *Oral Instruction Transmission* — namely, the causes and conditions, main diagnostics and treatment sections. At both Men-Tsee-Khang and Sorig Loling, if a student can perform the recitation of the first, second and fourth tantras, usually taking three to four hours to complete, he or she will receive high honors and, at SLL, a monetary award at graduation. If one can recite the first two tantras, then one is given honors and, at SLL, a

smaller monetary award. Reciting the entire four tantras takes several days and has only been accomplished by a few individuals in recent history, one of whom was Pakmo Tso, a student two classes below mine in SLL, in May 2016.[101]

Teaching Styles & Class Experience at MTK

Gen Yeshe Gelek characteristically started each class in the same way: "Then the Sage Rigpe Yeshe responded to the Sage Yidley Kye's question about how the Four Tantras should be taught," reciting the similar first lines of each chapter of the *Four Medical Transmissions*. "'Yes, Yidley Kye, the formation of the body is understood as follows…'" Each teacher had a slightly different approach to teaching class. However, for the most part, each teacher at Men-Tsee-Khang approached instruction by providing word-by-word explanations of the *Four Medical Transmissions*.

In one of our first days of class, Gen Yeshe Gelek taught us the five types of teaching, describing them from a classic text which presents them as metaphors. First, he said that a text can be explicated like a waterfall in which the teacher provides a deluge of explication with rich examples, explanations and case studies. Second, he said the text can be explained by experience in which the teacher gives very little explanation but demonstrates the meaning experientially to the student. Third, a teacher can explain a text stanza-by-stanza in which the meaning of each word and verse is elucidated. Fourth, a text can be understood by its commentaries that have been written by the great minds of

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[101] An individual who recites the entire *Four Medical Transmissions* receives his or her choice of any job or education opportunity. I believe they even automatically receive the next degree award in Tibetan medicine, *Menrampa*.

history. And fifth, the text can be understood through direct insight where the student gains understanding through fully understanding the meaning instantaneously without requiring explanation or experience. He explained that most teachers use the stanza-by-stanza approach since we can look up commentaries on our own, we will slowly gain experience, and we can cultivate Buddhist practice to gain direct insight into the text. At times, teachers will provide the waterfall method as well, he said.

"Okay, where did we leave off?" asked Nyima Gyaltsen, one of our newer teachers, who had just been hired to the faculty after nearly a decade working as a clinician in the Tibetan refugee settlement near Bangalore, in south India. Without fail he forgot where we left off the previous class. Though his word-by-word explanations were often slow, he incorporated rich examples from his clinical experience to highlight key concepts and indications. Such case studies seemed invaluable for providing clarity on passages of the text.

Gen Tenchöe, who had spent relatively little time in the clinic, rarely used real life examples, but instead elaborated in great detail on related theory or commentaries. His voice boomed in voluminous waves across the room, and then dropped sharply in a decrescendo. We sat near the edge of our seats, straining to hear what he was saying in the quiet moments, until again he released a thundering volley of words and we would fly to the back of our seats by the bellow. I found his class difficult to track and hard to apply to practical experience, but he was considered one of the senior teachers of the institute, principal of the college, and faculty with the longest tenure.

A surprising experience for both Inga and me was the amount of time used by teachers to scold us in class. They took long periods of each class to admonish the class for being lazy and neglecting to rigorously approach our studies and analyze all the fine points of the root text and commentaries.[102] I described my class experience to Geshe Lobsang, Emory-Tibet Partnership Director and Emory Religion department faculty, who was visiting Men-Tsee-Khang later that first summer. "Why do they use so much class time to scold us?" I pleaded with him. He smiled, and said that he did not have an answer.

I received my first partial answer to this conundrum when speaking to the parents of three boys in my class. Two of the boys belonged to the mother, and one of the boys to the father, to form a "blended" family. The mother laughed at my distress. "You don't understand," the father said, "They [the teachers] *have* to scold the students — otherwise the students won't do anything! In the old days," he continued, "They would beat them. If the kids aren't treated harshly, they won't do any studying. The kids are lazy. They need that to be motivated to study," he said.

I had heard about the Dalai Lama describing his gratitude to his own tutor for the lashes he received over the years, leaving scars on his shaved head to this day. "I would not have studied hard without this pressure," said the Dalai Lama, showing the evidence of scars on his head. It reminded me of a remark, disturbing to me at the time, that Amchi

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[102] I soon tracked the number of minutes per class a given teacher would scold us or go off on another topic completely unrelated to medicine or our studies. It was often thirty to forty minutes of a fifty minute class. Exasperated, I wrote Gen Wangdue, a teacher who I thought I had had a good relationship as a student since he had tutored me years before when Gen Khenrab had gone out of town for a few weeks at a time. I emailed him while he was in Vienna, where he had been sent by Men-Tsee-Khang for yearlong stays as a visiting instructor from Men-Tsee-Khang to teach foreigners. So I assumed he had a wide perspective. I thought he would be equally shocked at how much time was wasted in each class. Instead, he scolded me and said I did not have proper respect for the tradition.

Khenrab made to Geshe Lobsang when telling Geshe Lobsang about my admittance to Men-Tsee-Khang after the entrance exam. “Now I can beat her!” Amchi Khenrab said, chuckling and smiling, to Geshe Lobsang. Geshe Lobsang smiled, and then reached out to reassure me, likely seeing my surprised look, “They no longer do that — don’t worry.”

The second part of the answer to my question came when I spoke with the Literary Research Department Head, Gen Jamyang Gyatso, a relative of Amchi Khenrab. “Our students are too young,” Amchi Jamyang said. “They have no life experience and do not value the opportunity they have of studying Tibetan medicine. They do not understand what a tremendous field of knowledge it is and how lucky they are to be able to study it — and the work required to study and train well in it.” I concurred and described how I had heard that inside Tibet some schools complete the curriculum in three or four years. “Yes! Exactly, that is easily possible,” said Gen Jamyang, “But here, we have to mature the students. They will be too young to go treat patients and be doctors if they are let out too early and young. We need time for them to grow up, so we have to teach them slowly.”

In many ways, students at Men-Tsee-Khang were also expected to grow up and mature slowly, as the foundation for their medical knowledge and practice developed gradually. A similar approach was assumed for their Buddhist practice, seen as integral to their aptitude for gaining expertise in diagnostic skill as well. I understood that a reason students are recruited young is to maximize their memorization capacity while their brains are supple. The cognitive neuroscience understandings of brain maturation and optimizing working memory development during adolescent years will be discussed

further in the next chapter. However, the possibility of a faster paced progression through the Tibetan medical curriculum proved true when I transferred to Amdo and found that everyone goes through the entire curriculum in four years, with the same amount of memorization, and often more students performing the long *Two* and *Three Medical Transmissions* recitations at graduation, than at Men-Tsee-Khang.

"Teachers are also responsible for the development and maturity of the student," said the mother of two of my classmates. "They are not supposed to just teach medicine. They are responsible for the quality of the individual—their character, behavior, role in society, everything." This statement provided a window into the nature of the teacher-student relationship. Accepting someone as your teacher or, vice-versa, a teacher accepting someone as their student, was much more than just a willingness to teach material; it was taking responsibility for another human being to be under one's wing and direction. The behaviors and outcomes of that individual ultimately reflected on the teacher since it is assumed it was his or her cultivation and rearing that created the individual. This made more sense as to why teachers would diverge drastically from medically related content in class, and why it took five years of coursework and one more year of internship for the training, and even longer at the medical school in Sarnath.

Transitioning to Xining

Compared to Dharamsala, Xining was quite a different setting in which to study Tibetan medicine. I spent time from spring 2010 to late summer 2013 at Men-Tsee-Khang Dharamsala, sitting in pine and oak woodlands on a thick bed of pine thatch to do my

memorization, surrounded by medicinal herbs scattered throughout the hillside and exploring a glacier several hours hike up the mountain. Xining, by contrast, was a bustling, modern, dirty Chinese city.

I made my first trip to Xining to explore the possibility of Tibetan medical school again in the winter of 2009 before sitting for the Men-Tsee-Khang entrance exam in spring 2010. I recalled it as dreary and dismal. Distant factories clouded the sky with soot, and the nearest nature was a hill on the south side of the city that seemed impenetrable, a wall of tall apartment buildings blocking access. I found a small footpath leading up onto the hill amidst the debris of a construction site for an adjacent new set of apartments. Climbing the path atop fragments of cement from the previous demolition, I entered a depressing scene of spindly recently planted trees on the verge of desiccation, trash wrapped around their bases. The hill looked like it had been denuded of life at one point, deforested and scraped bare. Now homogenous and lifeless grass had taken over the hillside with young tree samplings thrust into cavernous holes dug into the ground. I looked across the valley and saw a landscape of endless towering buildings, cement and glass. Around the edge of the city, red-earth mesas devoid of vegetation provided steep cliff enclosures for the well-developed valley of tightly-packed, tall, narrow apartment and commercial buildings.

Although this first impression of Xining dissuaded me from initially studying there, my return two winters later, just before entering my second year at MTK, in 2012 left quite a different impression. I asked one of my professors from the US to reach out to contacts at the medical school there to see if I could do a month-long apprenticeship in

the Tibetan medical hospital. I was quickly becoming aware that at MTK we would gain no clinical practice exposure in the five years of coursework before internship. I felt desperate to gain practical experience that would help me understand what I was learning theoretically. I also was not sure if my doctoral program at Emory would allow me to stay for longer than two to three years. I could always come back to complete the medical education after I graduated from Emory, but my research itself depended on observing diagnostic moments with senior physicians.

A professor at the Tibetan medical school responded to my American professor's request and agreed to arrange some clinical time for me at the Tibetan medical hospital in Xining. Although the city looked largely the same as my previous visit, the sky was bright blue and the city seemed cleaner somehow. During my first two years at Men-Tsee-Khang, in addition to the lack of clinical exposure, I found much of the class time was used for topics and content unrelated to medicine. I became frustrated that only a couple of professors seemed dedicated to providing a quality and rigorous education to the students. When I visited Xining again, perhaps my frustrations with the educational experiences in D'asa created new eyes with which to appreciate Xining and the learning opportunities there. No doubt, His Holiness's recommendation to study there was forefront in my mind.

In one short month in Xining, I was able to observe hundreds of diagnostic encounters with patients in both outpatient and inpatient wards. I interviewed senior and junior physicians in gastroenterology and gynecology. I was not only impressed with the access I had to observe and learn clinical practice, I was astounded at the extent of

practice, the integration of external treatments (which I rarely saw in Dharamsala, let alone among any India-based Tibetan *amchis*) in the hospital infrastructure, and the records doctors at the hospital maintained.

I decided to start exploring the possibility of studying in Amdo again and approached the Tibetan medical college professor about the admission process. To my surprise, he was quite open to it and said that the policy regarding the required HSK Chinese Proficiency Test for foreigner students had changed. However, he was not convinced that their education in Xining would be better than what I was receiving in Dharamsala. He questioned me extensively about my experience at MTK—the exam procedures, memorization requirements, clinical exposure and so forth. Through the conversation, it became increasingly apparent to me that the education in Xining was more rigorous, the professors more engaged in the education experience, and the students more systematically prepared for clinical practice. For example, while the same amount of memorization was required, the Xining college placed additional emphasis on comprehension of content. I assumed that what I would be losing by transferring from Dharamsala to Xining was access to and discussion of Buddhism, although that would be somewhat disproven later.

Teaching Styles & Class Experience at SLL

At Sorig Loling, the classroom ethic was quite different. It was not clear to me if the distinct approach was due to the overarching academic setting at a large state university in China, and pressures, of this context. However, it was striking how much

more focused teachers were in class, making sure they used every spare second of class time for teaching the course content, and having little tolerance for students who were not making proper use of time in class. Teachers integrated powerpoint presentations frequently, illustrating key sections of the text, medicinal ingredients, therapies, and images of case studies of the illness. Powerpoints were never done in our main class at Men-Tsee-Khang and only for special presentations held in the main assembly hall. Students were encouraged to develop this skill with a student-led presentation once per week as skill-building for more contemporary pedagogical and professional approaches. Our teachers at Sorig Loling also frequently drew theoretical and practical links to other parts of the text. Instead of scolding us for not scouring the hundreds of commentaries for distinctions on each section of the *Four Medical Transmissions* as teachers did at Men-Tsee-Khang, the Sorig Loling teachers themselves would present key points of distinction from the commentaries.

I found the teaching much more efficient, enriching and invigorating. We also had frequent observations scheduled at the Tibetan medical hospital relevant to the topic of each course. Once we felt we were ready to present our required memorization for that particular course, we scheduled an individual time with one of the teachers to present it. Likewise, the official oral exam was much earlier in the semester and was scheduled per class so that we could move on to the content of the text instead of devoting time to remembering and solidifying memorized sections. This was much more efficient. Despite the continued need to remember the root sections for the written exam at the end of the

semester, it was helpful not having to prepare for the single comprehensive end-of-semester oral exam like at Men-Tsee-Khang.

At first I thought this might imply that our required memorization was less than that at Men-Tsee-Khang or that students were less competent in memorization, but rather more students at Sorig Loling than at Men-Tsee-Khang were performing the extended two, three, and four transmission recitations, the latter of which had yet to be done in exile, at the end of the year for honors and financial award.

I also found my classmates at Sorig Loling to be more diligent. This might be unique to being in Amdo, since the region is known for its hard work and productive qualities. However, it also seemed a likely result of the number of students in the school, a competitive atmosphere for opportunities, and a shared work ethic that could then translate into stable professional opportunities and compensation.

Curricular Progression

In large part, the curricular progression at Men-Tsee-Khang and at Sorig Loling was relatively similar. The first year covers the *Root Transmission* and half of the *Explanatory Transmission*. The second year covers the second of the *Explanatory Transmission* and the initial part of the *Oral Instructions Transmission*, with some coverage of the pulse and urine chapters of the *Subsequent Transmission*. The third year focuses almost exclusively on the *Oral Instructions Transmission*, compendium-by-compendium, with some additions from the *Subsequent Transmission*. And the final year completes the *Oral Instructions Transmission*, and finishes the *Subsequent Transmission.*

It also integrates the final two chapters, which are capstone summaries providing language that describes passing on the Tibetan medical lineage to the student as part of completing study of the *Four Medical Transmissions.* This final year also included further study on accessory texts such as the *Notes on Medical Formulas (Zintik Yantik)* by Jamgön Kongtrul Lodrö Tayé, the *Crystal Rosary* (*Shelgong Sheltreng*) by Deumar Tenzin Phuntsok, texts diagramming the body and so forth.

Each year integrated the respective allegorical tree on the part of the *Four Medical Transmissions* learned that year. The tree is a pictorial depiction of key concepts in each section of the *Four Medical Transmissions*. At Men-Tsee-Khang each year had a tree that it recited; whereas at Sorig Loling, all trees were completed in the first two years. Buddhist logic and astrology were taught once per week throughout the Men-Tsee-Khang curricular years, whereas they were entire semester long courses at Sorig Loling, allowing for more efficient consolidation and integration of knowledge. Men-Tsee-Khang students went on two to three month-long medicinal plant expeditions during their tenure at MTK. Usually the first year was an introductory year with a practicum examination. The second year was the formal examination year, and the final expedition (which some batches do not do) was a refresher and largely contributing additional labor for the medicinal compounding department in gathering plants. Women exclusively gathered one plant (*tsa awa*[103]), and men gathered several varieties of plants. The differences in gathering assignments were divided according to gender skills—we were told that men have more endurance for long travel and strength to carry heavy loads of plants, and

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[103] རྩ་ཨ་ཝ།

women have fine eyesight and small fingers for locating and harvesting large volumes of the thin growths of *tsa awa.*[104] Admittedly, many of the plants we gather require significant risk in procuring. Though an agile nomad accustomed to rugged mountain travel, and arriving in India in his early teens, one of our classmates lost his life during our second year medicinal plant expedition when he was reaching for an *Aja Tser-ngön* (*Meconopsis* spp.) plant on a cliff. He slipped off the cliff, fell several meters in height, fractured his skull, and likely ruptured his spleen. Although they were able to carry him down the mountain and load him in a vehicle still conscious, he passed before they arrived at the emergency clinic in the nearby town.

Such risk was an assumed part of our expeditions and we were told that guys were more agile in these extreme cliff environments and could manage the risk better. However, our lead expedition teacher did allow me to join a couple expeditions to the high passes with the all male pharmacy team because I had a high-quality camera for taking close botanical images, he knew of my experience mountain-climbing, and commented that my strong body constitution would allow me to keep up with the young male pharmacists.

Sorig Loling students did not have as long of a plant expedition because students did not assist the pharmacy in procuring plants. At Sorig Loling students had one formal ten-day expedition with examination on both identification and potencies of each specimen. Thereafter, the professor in charge of the class led his or her students on subsequent medicinal plant expeditions each year as desired. Gen Tashi Dhondup

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arranged at least one medicinal plant expedition per year with his students; however, he was an exceptional class director.

At MTK, students are also required to attend weekly Western science classes, a new development with my batch, Batch 17, from which I was exempted given my background and experience in science. At Sorig Loling, my classmates were required to take a select number of Western medicine classes and some political theory classes. I was exempted from these classes, too. The level of science education in Amdo is much higher than that in India, so students were quite familiar with basic biology and chemistry before beginning school at Sorig Loling.

MTK held a full year internship for its students, who are assigned to a clinic for the entire year somewhere in India or Nepal. Sorig Loling required a six-month internship with two to three week rounds through the various departments at the Tibetan hospital. Sorig Loling also required a graduating thesis, which Men-Tsee-Khang did not require. However, Men-Tsee-Khang students may decide to publish a book upon their graduation which provided them similar honors to the recitation performances.[105]

Examinations

Examinations were also quite different between the schools. Men-Tsee-Khang examinations almost uniformly comprised ten questions to which we were expected to write responses of the relevant memorized root stanzas and an explanation. The oral examination was a laundry list of chapters from the *Four Medical Transmissions*, which

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[105] See for instance, my classmate Za Sershul Kunchok Lhamo's *Embryology* (2016)

we had to recite at one sitting, usually taking an hour per student. Then we recited part of Khenrab Norbu's medicinal plant names book or the anatomical measurements of the body, and excerpts from other required texts. Finally, in a separate oral examination, we recited the allegorical tree written in verse form assigned for the year, while simultaneously placing sticks and beads for the symbolic roots, trunks, branches and leaves of the recited portion of the tree. It took an enormous investment of time to keep all the memorized sections fresh throughout the year to be able to eventually perform them at year's end.

Sorig Loling's examinations were different. As described earlier, the oral examinations were given by course and toward the beginning of the semester for each course. This allowed a significant amount of time for studying the content of the material and preparing for the written examination. The memorized texts and key stanzas still needed to be kept fresh, but the time for reviewing so it could all be performed at one time was not necessary (but still done by many students). The written exam required the student to provide definitions to key terms, fill in the blanks (from root stanzas), true/ false, multiple choice with multiple correct answers, short response, essay answers, and case studies for which we needed to provide the differential diagnosis and treatment approach. The approach at Sorig Loling tested our understanding of the material more effectively, as well as the ability to know the root stanzas, and prepared us for clinical practice more effectively.

Contemporary times and new approaches

I had many conversations with Gen Jamyang comparing contemporary Tibetan medical education with that of their time as students, and the decades before in Lhasa. He described contemporary changes in Tibetan medical education similar to those affecting medical education generally in the West, "There are more clinical specialities and professional disciplines—more and more students must focus on just teaching, research, or seeing patients after they graduate. It has become much like Western medical education and professional specialties. We no longer have the luxury of time." Gen Jamyang compared this assessment to a decade earlier, "Even from Gen Khenrab's batch to my batch[106], when [our teachers] tried to increase required memorization loads to emulate what the education was like at Lhasa Mentsikhang during Amchi Yeshi Dhonden's days[107], they had to reconsider. It was too much. So they ended up finally reducing the required memorization and the degree of exactness of the recitation expected on oral exam after my batch because it was too difficult for students." He also described how exposure to more Westerners and Western medicine emphasized new curricular needs, "Alongside our normal Buddhist philosophy, literary skills, and astrology classes, we were integrating more and more science classes. Students are no longer monastic,

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[106] Batch 9 to 11.

[107] When Men-Tsee-Khang was first established in exile, conditions were difficult, Gen Jamyang said, and they could not provide a strong education. As the years progressed, the education improved until it was quite good by the time Gen Khenrab was a student, and thereafter when Gen Jamyang was a student. Much has stayed the same up until present time, but Gen Jamyang did note greater emphasis on selecting students with a science background, providing science training during the medical curriculum, and expecting more publications and efforts in research. Time available for memorization was constrained though still significantly emphasized. He also noted very few monastics coming to Men-Tsee-Khang.

they are expected to do much more in terms of research and integration of science, and there is not enough time for this approach anymore."

Searching for the historical locus of medical education tradition

It is important to realize that the institutional pillars of Tibetan medicine and Tibetan medical education are relatively young: Chagpori Medical College began in the seventeenth century commissioned by Desi Sangye Gyatso after he had a vision at the hill of the future school site while on pilgrimage to the Drupbhog Lhakhang built in 1430 by master yogi and engineer Thangtong Gyalpo. Desi Sangye Gyatso's had a version on Chagpori hill in which the natural features and temple structures resembled the mythical city of Tanadug as described in the first chapter of the *Root Transmission*, with a palace in which the Medicine Buddha presides and medicines of cooling and warming properties grow on the north and south hillsides, respectively (Hofer & Larsen 2014:258). Sangye Gyatso commissioned a new building dedicated to medicine and to medical-spiritual practice but even up until the late nineteenth or early twentieth century, it still did not function as a major medical clinic for seeing patients. It was, from its inception, part of a larger effort aimed at "newly defining the medical sciences, with a view to establishing and maintaining the hegemony and political power of the Gelugpa order and the Ganden Phodrang government" (Hofer & Larsen 2014:259-261). Its main physicians and students were to provide care and medications to fellow Gelugpa Buddhist monks and high government personnel, as well as visiting members of the Lhasa aristocracy. "The general public probably did not even perceive Chagpori as a place to receive medical care,"

writes Hofer and Larsen (2014:261). This meant that students themselves were likely almost fully recruited from Gelug institutions.

Lhasa Mentsikhang was founded in 1916, a few years after the Thirteenth Dalai Lama declared Tibet an independent state initiating various reforms in an effort to modernize Tibet and create a modern nation state (Hofer & Larsen 2014:261-2). As such, Mentsikhang's mission was distinct from that of Chagpori. In contrast to the concept of Chagpori as a monastic medical college, Mentsikhang aimed to teach students from diverse social groups rather than only Gelugpa monks (Hofer & Larsen 2014:262). Along with this distinction in purpose came the first female students formally recognized in Tibetan history, such as the one I mentioned earlier, Yangchen Lhamo, famous for cataract surgery. In addition to monastics, students were recruited from the Tibetan army and lay medical and tantric lineages, seeking to apply their knowledge outside the Gelugpa monasteries "potentially in the service of the state and the wider society" (Hofer & Larsen 2014:262). Gen Jamyang had told me, "They were still primarily monastic in the early days of Lhasa Mentsikhang, like a monastic college but without the name" (Jamyang Gyatso 2017), however, the aim was much broader. Jampa Thubwang was the first director of Mentsikhang and the senior personal physician to the Thirteenth Dalai Lama as well as highest-ranking monk official (*Chigyab Khenpo*). His close and brilliant student, Khenrab Norbu, a monk from modest origins, soon became his successor and eventually headed both Mentsikhang and Chagpori.

During the first half of the twentieth century, and during the time that Amchi Yeshi Dhonden was at the institute as a student, Khenrab Norbu was developing Tibetan

medicine in Lhasa significantly (Hofer & Larsen 2014:262). Khenrab Norbu is known for reforming the medical curriculum by reducing the overall period for study, and writing and introducing his students to shorter medical treatises that offered concise summaries of many of the most important topics in medicine[108], such as the medicinal plant enumerations and descriptions, *Cluster of Wondrous Gold: A Concise Manual to Medicinal Herbs,* mentioned above for which Inga and I had inadvertently produced our own melodies when memorizing. Mentsikhang doctors were also known for treating many patients, and later it became the center for a maternal and child health campaign throughout the region, including encouraging parents to order birth astrological charts (Hofer & Larsen 2014:262). A commitment to public health initiatives, Mentsikhang is also known for distributing its medical texts, including Khenrab Norbu's *Mirror of the Moon* and Jampa Thubwang's *Jewel of the Heart* to administrators of all ninety-six districts under Lhasa governmental jurisdiction. From its inception, Lhasa Mentsikhang was envisioned as a more secular medical institution, distinct from Chagpori monastic college known for integrating Gelug religious practices with medical studies and providing a place of worship for the general Lhasa population (Hofer & Larsen 2014:264-5). Thus, D'asa Men-Tsee-Khang retains this history in its own approach to medical education: enacting religious practices for particular occasions, but not as its central focus and not from any particular sect, and expanding its reach wide for the greater population and the most critical health needs (Kloos 2008, 2010).

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[108] Two noteworthy examples are: མཁྱེན་རབ་ནོར་བུ། ཉེར་མཁོའི་སྨན་སྦྱོར་འཆི་མེད་བདུད་རྩིའི་བྱམ་བསང་། (Delhi: DP Works)

Garrett's description of the transmission of medical knowledge in Tibet from the twelfth to seventeenth centuries characterizes the particularly strong linkage to the Nyingma School (Garrett 2014:179), its integration of medical learning and Buddhism, and its longstanding intimacy with Buddhist sects of royal and political power stemming from the Drangti medical lineage and its offshoot traditions. Garrett also notes that institutional and curricular training in medicine became firmly embedded in Buddhist monasteries across Tibet through prominent medical colleges (2014:179) where teacher student-relationships and the conditions for generating micro-traditions were strong.

Amchi Yeshi Dhonden's reflections of his education at Lhasa Mentsikhang depicted a small student groups learning from a main teacher. Distinct though it was for its time period, it epitomized several aspects that my teachers described as central to learning Tibetan medicine even before it was institutionalized: learn and memorize the text, and gain experience in clinical practice and making medicine (Garrett 2014). I pondered what it would be like to study, see patients, and make medicine with the same teacher throughout our education. At both MTK and SLL, our education was administered by many teachers, and our internships and subsequent apprenticeships would often be with physicians other than those with whom we did our textual learning. From Amchi Yeshi Dhonden's story, I realized that this is a characteristic of contemporary Tibetan medical education—though the mechanics of memorization, recitation, and gaining clinical experience were the same, the mode of lineage and the teacher-student relationship has changed.

Chapter conclusion

The pedagogical approach both at Men-Tsee-Khang and Sorig Loling drew upon an intellectual history that characterized a proper education in terms of training in all five of the major fields of knowledge in Tibetan scholasticism, and a specific epistemological approach in which memorization and recitation play a foundational role upon which conceptual and experiential understanding is layered. In this process, various aspects of memory occured, various modalities of memory programming integrated—inculcating a specific embodied knowledge. It was a sophisticated way of implementing our understandings of enacted cognition into an educational context. From an understanding of the situatedness of our learning environments, and the contextual production of disease and health, the pedagogy formulated modes of learning that track modes of being in disease and health using perceptual means to track biomarkers identified as indicators mediating these processes.

From a Mauss approach to *habitus*, the medical training builds an understanding of one's body as the "first and most natural tool" (Mauss 1973b:56) in achieving one's goals; and it frames the goal tracking the relational pathways of disease and health so as to relieve suffering and distress. The body, mind, and senses are forged in such a way that they continually attune, integrating their embodied instrumentation toward the achievement of tracking disease pathways. From the Bourdieusian perspective, what is being 'learned by the body' becomes enacted, not as knowledge to be deployed, but as knowledge and methods of its procurement such that the knowledge becomes 'something that one is' (Bourdieu 1992:73). The sensitivities and proclivities that the work of

metaphor, visualization, and familiarization provide through the means of memorization and recitation of the text, inculcate specific 'affordances' of socio-cultural-ecological processes that direct perceptual tracking for drawing reliable inferences.

I will describe these processes more fully in the next chapters, both from the cognitive neuroscience perspective as well as Dharmakīrti's approach to perception and the instruments of knowledge. However, it is important to note here that the pedagogical base in Tibetan medicine integrates specific techniques of learning—memorization and recitation; metaphor and visualization; debate and logic; clinical, pharmacological and ecological experience—infusing each learning mode with specific content on anatomy and physiology, developmental ecology, pathology, social and cultural relations, psychology, and the means by which these various influences direct disease processes and the life course of health and illness. Just as the bioecocultural model of child development (Worthman 2010) has demonstrated, this vast network of influences on developmental trajectories and health outcomes, the pedagogical approach in Tibetan medicine inculcates such understandings of disease pathways through embodied modes of learning.

Chapter IV
Memory, Metaphor & Visualization:
Shaping the senses, priming the body, imbibing the pedagogy

Mnemosyne, said the Greeks, is the mother of the Muses; the history of the training of this most fundamental and elusive of human powers will plunge us into deep waters.
— Francis A. Yates, *The Art of Memory (1966:ix)*.

One can arguably claim that memory is the root of all culture. Before the human species began painting images on cave walls and molding artifacts, memory provided the mode of transmission of knowledge. The central role of memory in cultural transmission is why memory and language are inextricably linked. Externalized memory—books, photographs, museums and digital media—that we use to encode contemporary knowledge and experience often occludes our appreciation of the basic structures within each of us that produce those artifacts and memory aids. Internal memory has become devalued, and erudition is measured by the degree to which one can possess and know how and where to procure information in the labyrinth of external memory—and even more so today, in the ephemerally unlimited multi-dimensional universe of digitalized external memory. Externalized memory has also re-shaped how we understand and define intellect. The way we think and use our brain has changed drastically in the last several decades. A survey conducted by a neuropsychologist in 2007 found that a third of British under the age of thirty cannot remember their own home land line number without pulling it up on their handsets (Foer 2012:138). The same survey showed that 30 percent of adults cannot remember birthdays for more than three immediate family members. We have put our collective memory into smart phones, computers, and tablets as collective

memory storage devices, eliminating the need to develop and rely upon our own memories.

In my Tibetan medical classes, particularly at Men-Tsee-Khang, I was always struck by how characterizations of intelligence[109] by our teachers was synonymous with having a good memory. In the West, I had grown up with notions that one's creativity, innovation, entrepreneurial approaches to thinking and solving problems demonstrated one's intelligence—or one's mathematical or linguistic skill. However, the ability to memorize seemed to rank lowest on the order of intelligence. In fact, in school growing up, someone who memorized text or lists well would often be considered dull in intellect. However, as I gained more experience in the memorization process, I came to value the role it plays in shaping the intellect, and even more so, in cultivating both the cognitive content and cognitive modes of this medical field in which I trained as an *amchi*.

My experience with these methodologies led me to ask: what have we lost culturally and societally now that we privilege external memory storage and procurement and have virtually lost internal memory development and enactment? What does cognitive neuroscience understand about the brain and acquiring embodied knowledge that can shed light on these learning processes? How do our understandings of memory, sensory perception, the interaction between memory, recited text, metaphor, and visualized experience allow this method to be a central driver in acquiring and mobilizing embodied knowledge? What are the limitations of current research in cognitive neuroscience in explaining these processes?

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[109] རིག་པ་ཆེན་པོ།

In this chapter, I review the cognitive neuroscience understanding of memory, metaphor, grounded cognition and simulation to set a context for how the processes of memorization, recitation, and the encoding of embodied knowledge can be understood from the biological anthropology side. I also look at several historic and contemporary applications of memory, metaphor and simulation outside of Tibetan medical education to contextualize these tools in a broader cultural framework that uses basic human evolved capacities for specific embodied learning applications. I look at how the cognitive, emotional, perceptual, and behavioral aspects of habit-formation not only form our narratives of self in relation to who we are as stemming from conscious memories, but how unconscious habits comprise some of the most core material of who we are, how we think, what we know, and how we knot—the implicit memories that comprise our experience of "self" and its capacities. I look at the ancient techniques of memorization and their role in character building, not just as knowledge obtainment, but true embodied knowledge of self-transformation. I relate this to the role of integrating implicit and explicit memory systems, and merging semantic and episodic memory through metaphor, memory techniques and visualization; and the ability for memorization techniques to drive creativity not extinguish it.

In the following chapter, I will look at how the same processes are understood from the Buddhist psychology perspective, and some of the Buddhist meditative applications that relate to the Tibetan medical learning context.

Memory and Memorization

Western cognitive neuroscience understands memory as requiring three main stages of formation and retrieval: 1) encoding and registration, where information is received, processed and consolidated; 2) storage, where encoded information is stored in either short or long term memory and a record is made; and 3) retrieval (also known as recall or recollection), where the stored information is accessed and utilized in response to a cue or intention. The three stages draw upon various regions of the brain, including those dedicated to perception, language, and movement (Kandel 2000:1228). As such, memories tend to integrate various forms of experience, behavior and conceptual understanding.

Encoding refers to attending to and processing newly learned information. For a memory to encode thoroughly, it must be meaningfully and systematically associated with knowledge already well-established in memory so as to integrate the new information with prior knowledge. Strong motivation also strengthens memory storage. Consolidation refers to the processes that transfer newly stored memories to make them stable for long-term storage. Gene expression and synthesis of proteins contributes to structural changes in the brain that retain memories with greater stability over time. Storage refers to the processes that retain memory over time. In contrast to short-term working memory that is very limited, long-term memory seems to have almost unlimited capacity. Retrieval refers to processes that allow one to recall and use stored information. Retrieval acts much like perception in that it is a constructive process subject to distortion and illusions. Retrieval tends to have greatest integrity when it occurs in the same context

in which the information was acquired and in the presence of the same cues occurring at the time of learning (Kandel 2000:1237-8).

Encoding and registration of information relies upon the somatosensory cortices for sensory input and on selective mechanisms for attention through the frontal and parietal lobes of the right hemisphere (Coull et al 1996). The areas of the brain most associated with memory storage and retrieval are the hippocampus and temporal lobes. The hippocampus is particularly associated with memory storage (Squire 2009) such that damage to this structure disables new memory input in such a way that new learned behavior is virtually impossible. However, even with bilateral hippocampal removal or significant damage to the temporal lobes, some memory capacity remains (Kandel 2000:1228), demonstrating how other structures are implicated in the formation and retrieval of memory. For example, the amygdala stores components of memories particularly related to emotion. The hippocampus controls short-term memory over seconds and minutes, as well as long-term memory for events that occur hours before and events that occur years throughout one's life up till proximal years. Memories associated with the most recent years seem to be controlled by the temporal lobes (Milner 1966; Kandel 2000:1228). The temporal lobes play an important role in the transfer of new short-term memories into long-term memories. Remembering people, places and objects for longer than a minute, and transferring such information into durable memory, relies on temporal lobe association. Thus, if there is damage to the temporal lobes, someone one has met previously will be forgotten in subsequent meetings. Likewise with temporal lobe damage, spatial orientation, navigation and remembering object locations are

impaired. Damage to the limbic association areas of the medial temporal lobe also cause similar memory deficits (Kandel 2000:1229).

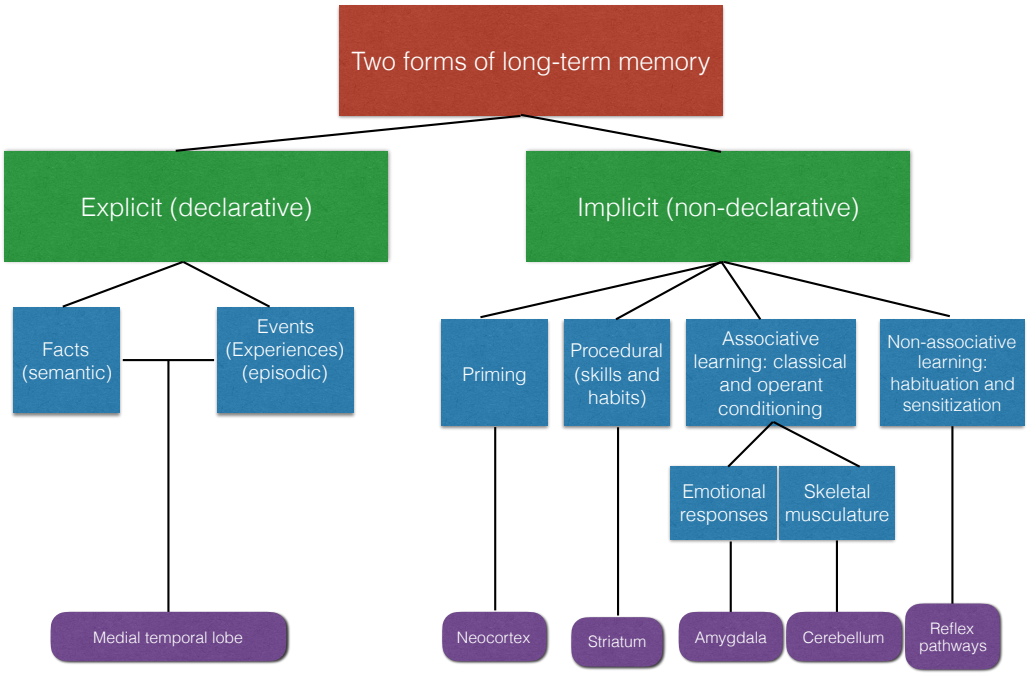
Memory retrieval of experiences is similar to when one actually perceives an experience. This can be seen with Tibetan doctors when they recall a section of text. I have described it as if the text manifests in mid-air and they are looking at the pages of the text to recall meaning. Many anthropologists have described a similar observation—the physician recites part of the text, pauses to consider the stanzas and then comments on the meaning.

Cognitive neuroscience describes two types of memory functions: implicit functions, also called non-declarative memory, and explicit functions, also called declarative memory (Squire 2009). In implicit memory, the memory is recalled unconsciously and typically involves training in reflexive motor or perceptual skills (Foerde & Poldrack 2009). In Tibetan medical training, this kind of memory would arise from repeatedly taking pulse, looking at tongue and urine, listening to qualities in the patient's voice and narrative, performing treatment modalities, and plant identification and processing for compounding medicine. I claim these are implicit skills and the primary mechanism of layering in embodied knowledge. In explicit memory, deliberate, conscious effort is employed to recall factual knowledge of people, places and things (Graf & Schachter 1985). For Tibetan doctors, the vast lists of illness categories, subtypes, characteristics, and diagnostics rely on explicit memory. The hundreds of plant names, their benefits, and the categories of medicine classes to which they belong, the names of points on the body for treatment, anatomical structures and so forth also rely on

explicit memory. This explicit declarative knowledge merges with implicit non-declarative knowledge when the skills become enacted. The memorization of terms, categories, lists, functions and so forth may seem familiar to a Western medical student initially, though we shall see shortly how it differs in the mode in which it is delivered to ease the memorization process and synthesize implicit and explicit memory. I argue that Tibetan medical pedagogy overtly merges explicit and implicit forms of memory development in order to produce rich embodied knowledge in the physician as diagnostic instrument.

In order to clarify these various memory processes and how they apply to the context of memorization, recitation, visualization and clinical experience in Tibetan medical pedagogy. I will use modifications of the diagram below to summarize and build these relationships.

Diagram 1. Long-term memory processes



Adapted from Kandel 2000:1231

Implicit memory is considered to be more rigid and tightly connected to the original conditions under which the learning occurred, which can provide an environmental stimulus to invoke the memory. Explicit memory is characterized by substantial flexibility and capacity to associate various pieces of information. Thus, we see two types of memory: one that is reflective, requiring conscious awareness or complex cognitive processes, such as comparison and evaluation; and the second that is reflexive and involves habits and motor or perceptual skill (Kandel 2000:1230). Explicit memory requires the temporal lobes and association areas, whereas implicit memory requires the cerebellum, amygdala, and the specific sensory and motor systems necessary for the task being learned.

Knowledge stored as explicit memory must first be acquired through processing in one or more of the three polymodal association cortices—the prefrontal, limbic, and parieto-occipital-temporal cortices—which synthesize visual, auditory and somatic information (Kandel 2000:1231). From the polymodal association cortices, the information is conveyed to the parahippocampal and perirhinal cortices, then to the entorhinal cortex, the dentate gyrus, the hippocampus, the subiculum, and then back to the entorhinal cortex where the information is sent back to the parahippocampal and perirhinal cortices and finally back to the polymodal association areas of the neocortex (Kandel 2000:1231-2). Thus, we can see a looping process of information encoding.

Semantic & Episodic Memory

Psychologist Endel Tulving further classified explicit memory into episodic and semantic memory. He described episodic memory as a memory for events and personal experience, and semantic memory as a memory for facts (Kandel 2000:1230). Episodic memories have a specific context in time and space in which they are linked (Foer 2012:81). In the Tibetan medical context, episodic memory would be remembering a clinical context in which one was introduced to a new patient case with all its contextual detail of spatial and perceptual content. Semantic memory is a type of long-term memory that stores knowledge of objects, facts, and concepts as well as words and their meanings. It retains names of objects, definitions of spoken words and verbal fluency (Kandel 2000:1233). For example, a Tibetan physician must remember that there are five subtypes of *rlung*, as well as five subtypes for each *tripa* and *béken*. Semantic memory exists

outside of time and space as free-floating bits of information (Foer 2012:81). Semantic memory encodes for specific meaning (Eysenck 2012) and episodic memory encodes spatial and temporal content (Schacter & Addis 2007; Szpunar 2010).

The interplay of semantic and episodic memory can be seen in autobiographical memory, which is part of explicit memory as well. Both episodic and semantic memory contain knowledge that can be described in declarative statements, just as with one's autobiographical narrative. However, although both semantic and episodic memory critically rely on the hippocampus and other structures within the medial temporal lobes, they ultimately have different neural pathways (Foer 2012:82). Damage to multimodal association areas can interfere with semantic knowledge but not episodic knowledge, or vice versa. For example, a person can recall facts about certain individuals like friends and famous people, such as their names and characteristics, but may not be able to recall any specific events related to those individuals, or vice versa.[110] Explicit memory is most closely associated with the perirhinal and parahippocampal cortices, the association areas in the temporal cortex with which the hippocampus connects (Kandel 2000:1231). Lesions to these areas are associated with impairment of some forms of explicit memory, while leaving other forms functionally intact.

Memorization and recitation draw on multiple modes of these representations: words that are accessed visually, words that are produced through recitation and aurally

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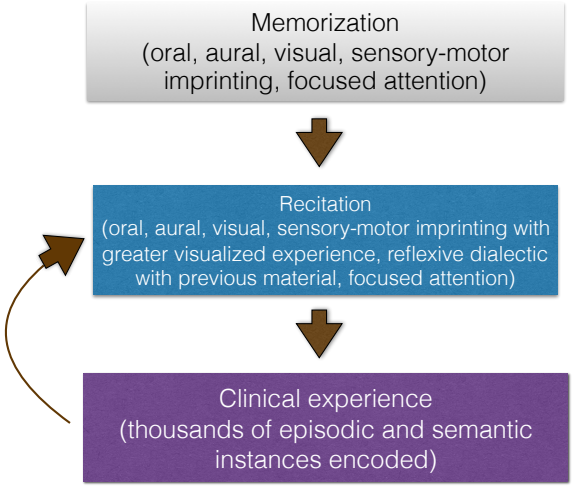
[110] Research has shown episodic memories tend to become semantic memories with time, a phenomenon known as Ribot's Law after the nineteenth-century French psychologist who is credited with first noting it. Sigmund Freud described a similar process in which early memories tend to be recalled in first person, whereas older memories are recalled as if in third person or being viewed through the lens of a camera. One hypothesis is that while the hippocampus is involved in initial formation of memory, the long-term storage is ultimately in the neocortex. Thus, as memories are revisited and reinforced, they become held increasingly in cortical connections that allow separation from the hippocampus (Foer 2012:82-3).

heard, sensory-motor experiences that are accessed through the metaphors and evoked visual imagery. Many layers of encoding occurs in the mere memorization and recitation process, on top of which thousands of episodic and semantic instances of clinical experiences are later encoded. The diagram below illustrates the layering process.

Diagram 2. Layering in memorization, recitation, and clinical experience



Working Memory

Short-term, or working, memory retrieves information encoded from sensory stimuli for both explicit and implicit functions. It also draws upon previously stored information.[111] The initial memorization of a text is a form of short-term, or working, memory. The pronunciation of syllables and muscle memory during recitation forms implicit memory; and the content in the stanzas forms explicit memory.

Working memory is thought to have three component systems: an attention control system (or central executive), which focuses perception on specific events in one's environment and is located in the prefrontal cortex (Kandel 2000:1239) and the two rehearsal systems that the attentional control system regulates, the articulatory loop for

[111] Particularly in the case where long-term memory stores information through categorical models or systems (Baddely 2007).

language and the visuospatial sketch pad for vision and action (ibid). The articulatory loop maintains memory for words and numbers through subvocal speech that allows one to hold these rapidly decaying bits of information in one's mind. The visuospatial sketch pad represents the visual properties and spatial location of objects. The information in these two systems, thought to be loaded in different regions of the posterior association cortices, can be transferred to long-term memory (Kandel 2000:1239).

I found that memorization was not only a study tool — conceptually patterning the mind into a distinct way of seeing relationships in the world — but also a daily practice in training that focused attention. Memorization also builds experiential layers and further conceptual layers to the theoretical content that is being memorized in the text. In the context of memorizing the text, small portions of text, such as a half page, are repeated hundreds of time such that the motor learning of the oral production of syllables, the articulatory loop for language and the visuospatial sketch pad for vision and action evoked from the visual imagery of the content of the text are encoded in working memory through sustained attention control, and encoded into the bodily experience. As such, one would expect sensory-motor cortices as well as the cerebellum to be activated in these processes. The "phonological loop" is a short-term memory buffer which can only store sounds that one hears for a couple seconds without rehearsing them. Research has not been done on how articulating written words aloud helps one remember. I propose that the intentional verbalization of words that one has memorized, as in the Tibetan medical context of reciting the *Four Medical Transmissions*, facilitates the transfer of words and verses into long-term memory.

Implicit Memory & Priming

Implicit memory also involves "priming" and procedural memory. Priming is the process of accumulating unconsciously learned behaviors and responses that may be subliminally elicited from unconscious memory (Tulving & Schacter 1990). It is the recall of words or objects that improves by prior exposure to these words or objects. Priming also works for perceptual information. Patients with amnesia may have no conscious memory of having seen a word or object before, but will correctly select as many objects that were previously presented as a normal subject would (Kandel 2000:1230).

This is where the Buddhist distinction of intention comes into play. If one cognitively engages with a subject to understand and remember, it would enter declarative or explicit memory. In the absence of intention, much information enters our mind without our conscious engagement with it, this kind of information would be stored in non-declarative, or implicit, memory. Perceptual memory is also part of implicit memory. Implicit memory provides the bulk of the subtle cognitive, perceptual, emotional, and behavioral "habits" that comprise our selves, the aspects of self, how we see, how we know, and what we know that is often assumed, but comes from these implicit memory learning processes. This is the process of embodied knowledge formation that is a fundamental driver in the memorization-recitation-experience engine that creates the transformative process of physician as embodied diagnostic tool as well as developing the critical related humanistic characteristics I will touch more on later.

Procedural memory involves the slow and gradual learning of skills, and accumulation of experience, without conscious attention to this learning (Eysenck 2012; Foerde & Poldrack 2009). In Tibetan medicine the memorization of texts and the enactment of clinical skills and behaviors of teachers integrates these various forms of memory. Priming and procedural memory work together to facilitate certain types of learning that need not be retrievable to conscious memory to improve a skill.

Two documented cases of amnesia provided the first evidence of priming. The two patients are known by their initials: EP and HM. Both individuals had lost their ability to make declarative memories, but had intact short-term memory, which led to the discovery of priming as an isolated functional capacity. EP was an eighty-four-year-old retired lab technician who had one of the most severe cases of amnesia ever documented (Steffanaci et al 2000). An infection of Herpes simplex in November 1992 had damaged both of his medial temporal lobes, including the hippocampus and several adjacent regions. Since memories are stored in the neocortex, not in the hippocampus, he was able to receive memories from perceptions but not encode them into long-term memory. He had both anterograde and retrograde amnesia, in which he could not form new memories nor recall old memories, respectively (Foer 2012:72), at least not since 1950, before which he retained vividly clear memories of his childhood and so forth. EP provided a unique study subject since very few other individuals in the world had experienced comprehensive damage to both hippocampi and the key adjacent structures with an otherwise intact brain (Foer 2012:72).

The case of HM[112] with similar brain damage furthered this understanding between differential memory functions. HM underwent experimental surgery to stop debilitating seizures in which the neurosurgeon removed most of the hippocampus as well as much of the surrounding temporal lobes. The MRIs of EP and HM are described as quite similar as well as the functional absence of long-term memory capacity (Foer 2012:78-9). HM's case is famous for the evidence that he improved at drawing between two outlines of a star and improving with each trial though he described never remembering having done the task before—a foundational discovery for priming (Kandel 2000:1230; Foer 2012:80). This means that there is a muscle memory in learning the skill in the absence of conscious memory that one has attempted the skill before (Kandel 2000:1230). Such memory functions are also associated with simple reflexive learning, including habituation, sensitization, classical conditioning and operant conditioning (Kandel 2000:1230).

Both EP and HM had lost their ability to make declarative memories, but had intact nondeclarative memory formation capacities, and thus could draw on the functional use of priming. Non-declarative memories do not seem to pass through the same short-term memory buffer as declarative memories, nor do they depend on the hippocampal region to be consolidated and stored. For example, the various types of priming can occur in motor, perceptual and habit learning. Motor learning occurs in the cerebellum, perceptual learning in the neocortex, and habit learning in the basal ganglia (Foer 2012:81). "Habit learning" refers to learning that came from studies of hippocampal

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[112] Henry Molaison

damage in human and non-human animals. Whereas hippocampal-based learning is contextually encoded (that is, particular to the spatial and temporal context at the time of memory formation), habit learning is similar to stimulus-response learning processes insensitive to context (Seger & Spiering 2011). Habit learning is "slow" learning in that it requires repeated trials. Hippocampal-based learning is "rapid" in that it can occur as one-trial learning. Habit learning has been described as a part of implicit memory in that it is a heterogeneous collection of abilities: motor skills, perceptual skills and cognitive skills, including examples from procedural memory, as well as simple classical conditioning, adaptation level effects, priming and other instances where experience alters performance independently of the conscious recollection of past events (Squire & Zola-Morgan 1988:171; Seger & Spiering 2011). This imprinting of this collection of skills in the initial learning periods draws primarily upon the basal ganglia. Due to the broad patterns of cortical projects to the basal ganglia, this makes sense in allowing it to be an association area for this wide variety of function learning. The basal ganglia is active during primary periods of this heterogenous collection of unconscious habit learning, that eventually gets transferred cortically for representation of well-established habits (Seger & Spiering 200). Thus, various modes of Tibetan medical learning through memorization and recitation would rely upon the basal ganglia in assembling these integrated forms of cognitive, procedural, perceptual and emotional skills. Even our narratives of self and relation to who we are stem from conscious memories; some of the most core material of who we are and how we think comes from the habit-forming of implicit memories that are inaccessible to our conscious brain (Foer 2012:81).

In memorization and recitation of the *Four Medical Transmissions*, priming encodes the stanzas in one's memory, providing exposure that will allow for retrieval and re-articulation at another time. My classmates and I discussed how we often do not consciously realize we remember various stanzas, but when primed with an initial part of the verse or a topic word, the stanzas will flow from our memory and mouth into words.

Chick sexing provides an apt example for priming. The two-year Zen-Nippon Chick Sexing School in Japan provides rigorous training to its students in order to identify a small "bead" in the cloaca of chicken genitalia to determine if the chicken is male or female. Approximately eighty percent of cloacas are not obvious to the untrained eye (Foer 2012:50-51). This is a tremendously important and economically expensive distinction for the chicken industry because only the females are kept for egg and meat production. The younger the chicks can be sexed, the less extraneous resources are given to male chicks, who are largely unwanted for the industry. Only five- to ten-percent of students in the school graduate to the five hundred dollars a day top-class position of Japanese chicken sexer (Foer 2012:51). Even the best professional sexers cannot describe how they determine gender in the toughest, most ambiguous cases, though they can identify 1,200 chicks an hour with 98- or 99-percent accuracy. Expert chicken sexers say it is intuition; however, an understanding of priming in the neuroscience of memory shows that this perceptual content can be highly accurate with minimal conscious awareness of how one implements the learned skill.

The memorization process in Tibetan medical education and its relationship to clinical praxis reminded me of learning edible and medicinal plants. During the years I

spent studying and working with the tracking and wilderness survival school in New Jersey, I entered rigorous learning of the natural environment, including the flora ecology in which I was living. Instructors in the school described novices as looking at a natural area and seeing a "Wall of Green" where little differentiation exists between one green thing and another. As one begins to learn leaf and flower types, growing patterns, plant structure, communities of plants, and seasonal variations, one can differentiate the landscape and notice distinctions, identify individuals and note deviations. The Wall of Green becomes a highly diverse landscape of individuals — almost like making friends at a party where the gathering takes on form from the individual associations one has made with each guest at the party.

Similarly, in Tibetan medicine, the text seemed to prime my mind to notice prototypical characteristics, patterns, pathways and distinctions, and to attend to subtle differences in pulses, urines, body types, tongues and the relevant details and idiosyncracies. As in tracking animals, any environmental landscape has its own confluences of weather, season, flora, and fauna interactions, and our job was to look at disturbance. Who were we looking for and how did their presence in this baseline environment create a disturbance that we can pick up? I found myself determined to get the half hour of reviewed recitation in early in the morning before going to patient rounds just so I could access this information — and perceive these details. I spent four to six hours per day memorizing new material in the *Four Medical Transmissions* and review previously memorized material with any leftover time. The time I had for the latter was

minimal but its benefit obvious. The approach to priming in Tibetan medicine seemed straightforward: memorize, recite, practice, recite, practice, recite, practice.

Tibetan diagnostics, particularly in urine and pulse, require the *amchi* to look for variation to baseline, and entrain the perceptual feel of baseline in one's fingertips on the patient's arterial pulse. The baseline, or constitution, for everyone is slightly different. Seeing patients repeatedly is critical — both for understanding what a given baseline is for an individual, but also variations to that baseline. The more exposure the *amchi* has to baselines for different patients, the more this "priming" effect encodes in his fingers and mind, and the more easily the *amchi* is able to pick out baseline from disturbance (or illness) in a pulse, in a urine sample, on a tongue, and across the full physical appearance and habitus. This priming also occurs through the visualization apparatus evoked by the metaphors memorized and recited from the text. Throughout my internship, I started cataloguing how many pulses I read each morning during patient rounds, how many urines I was able to observe, stir and smell; and how many tongues I could access for observation. I consciously engaged in the perceptual patterning, letting the text register in my mind and senses, and letting the practice engage with the textual cues to pattern my body as diagnostic tool.[113] For example, when taking a pulse that was "subtle, taut, and pounding"[114] like the classic tripa pulse, I recalled the stanzas with metaphors describing the finer variations of the subtypes for heat disorders: "Unripened heat [pulse] is subtle,

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[113] Here, in pulse and urine, I was gaining repetitions in "what is baseline" — as well as "what is imbalance" (in terms of illness) and laying down the ground work to recognize the disturbances to a healthy foundation. I had done this similarly when living in the woods practicing animal tracking and survival. Each day seemed to pattern itself on me — indicating its baseline: the fluctuations in air pressure, moisture, humidity, wind direction and speed, incident or ambient sunlight, cloud cover, aging on the soil, presence or absence of certain insects, birds, mammals, and so forth; blooming or dormant plants, et cetera.

[114] མཁྲིས་པའི་རྩ་ནི་ཕྲ་ལ་གྲིམས་པར་འཕར། (TIV, Ch 1:218)

fast, and unsteady like that of *rlung*; the pulse of spreading heat is fierce, taut, and pounding; the pulse of empty heat feels empty and races; the pulse of hidden heat is low in elevation yet taut…"[115] and so forth. I felt beneath my fingers on the pulse as if reaching inside the patient to appreciate the various textures, characteristics, and qualities the metaphors indicated, and the relationship to the organs, bodily characteristics, or entire physiologic system in which they arose.

"Muscle memory" is a form of procedural memory within implicit memory that consolidates a specific motor task into memory through repetition, also known as *motor learning*. When a movement is repeated over time, a long-term muscle memory is created for that task such that eventually the task is performed without conscious effort. Hence, my experience of "uploads" in the context of repetitive textual recitation of the Tibetan medical canon constituted a kind of muscle memory. The formation of muscle memory is experienced commonly when people learn to ride a bike, play a musical instrument, or even learn how to write (Krakauer & Shadmehr 2006).

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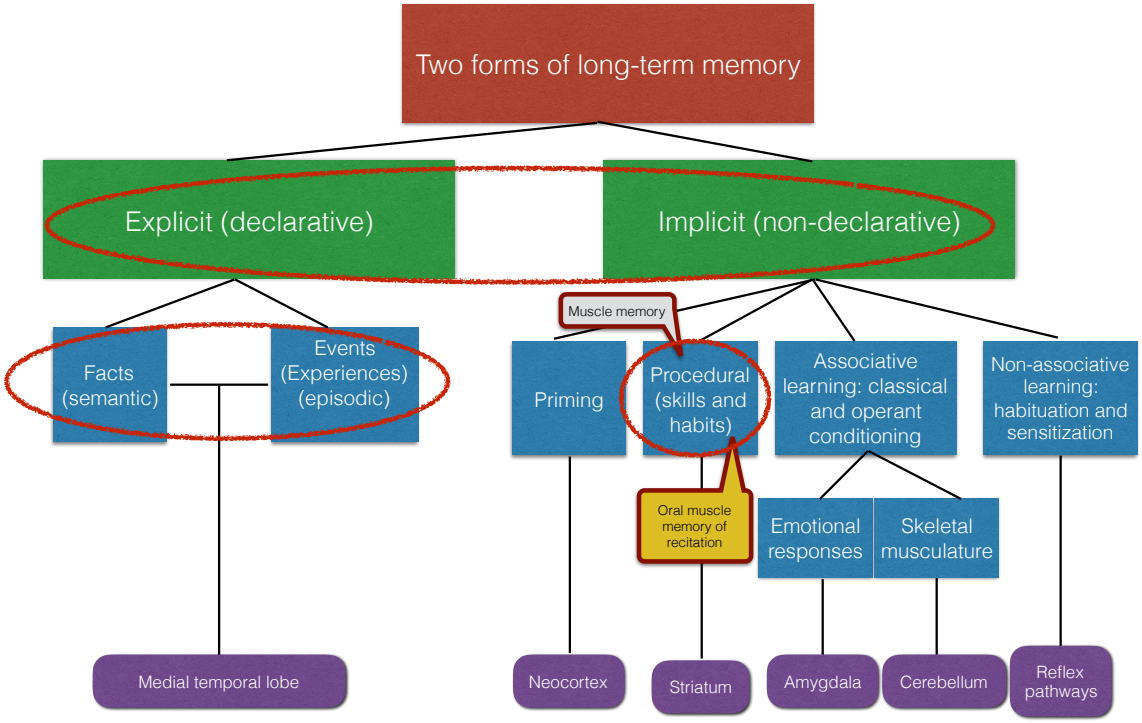
[115] མ་སྨིན་ཚོད་ཐུན་མཚོགས་བླུད་ཡོར་གཡོ། རྒྱས་ཚོད་རྩ་ནི་དྲག་ལ་བྱིམས་པར་འཕར། སྟོངས་ཚོད་རྩ་ནི་སྟོང་ལ་རྒྱུག་པ་སྟེ། གཏི་བའི་ཚོད་པ་རྩ་དཔངས་དམའ་ལ་གཅིམས། (TIV, Ch 1:218)

Diagram 3. Muscle memory and merging long-term memory processes



Adapted from Kandel 2000:1231

The pathways important for motor memory are distinct from those of declarative memory, which follow medial temporal lobe pathways (Shadmehr & Holcomb 1997). During motor learning, the active brain areas include motor and somatosensory cortices, which decrease activation once the motor skill is learned. Prefrontal and frontal cortices are also active during motor learning due to the increased attention needed to perform the task being learned (Shadmehr & Holcomb 1997). The main area active during motor learning is the cerebellum.[116] The basal ganglia is also considered important particularly with stimulus-response associations and the formation of the functionally heterogeneous collection of unconscious habits described earlier. When learning a motor task, the basal

[116] For an account of the cellular plasticity involved in motor learning see Boyden et al 2004 and Ma et al 2010.

ganglia-cerebellar connections are thought to strengthen with time (Packard & Knowlton 2002). Motor memory has two stages of encoding similar to that of declarative memory: a short-term memory encoding stage, which is fragile and susceptible to damage, and a long-term memory consolidation stage, which is more stable (Attwell et al 2002). We think of the short-term encoding stage as motor learning. The experience of getting used to the sounds of reciting the syllables in the Tibetan medical text is the initial encoding into muscle memory. The motor learning phase requires an increase in brain activity and an increase in attention. The extensive allocation of effort on focused attention to the production of syllables and syntax in textual recitation would necessarily increase attention capacity (Shadmehr & Holcomb 1997) and thereby develop the physician's ability for sustained attention with patients.

The transfer of motor memory from the encoding stage to the consolidation stage is thought to redistribute across brain regions such that "synaptic connectivity changes as a function of repetitive firing," a phenomenon known as Hebb's rule that cells that fire together, wire together. Thus, repeated stimulation from repeating a movement would cause a repetition of firing in certain motor networks such that these networks would gain greater efficiency of excitation over time (Packard & Knowlton 2002). This is why cerebellar involvement decreases and basal ganglia involvement increases—so the recitations would become easier and more automatic. The semantic and visuospatial aspects undergo the same process, integrating both content and visualized body and clinical experience. Thus, we see integrated encoding mechanisms for both implicit and

explicit memory across motor, visuospatial and semantic networks in the memorization-recitation example in Tibetan medicine.

Three years into my education, I was given the opportunity to do patient rounds with mentors each morning before heading to class. We would see forty to fifty patients per morning, sometimes as many as one hundred, checking pulse, urine, tongue and symptoms of the patients. When I arrived at my department in the hospital primed with having just recited the pulse and urine chapters[117] of the text, my mind was "tuned in" to catch the bodily cues, and characteristics of pulse, urine, tongue and so forth. I noticed more. When I did not do the recitation, I felt that I missed much of the information presented by observations of each patient. My fingers felt "unintelligent" on the pulse, and I felt foggy and unsure of my diagnoses. Because I had the opportunity to check patient files for confirmation of some of my assessments, I would find more discrepancies between the patient file and my own notes from the morning rounds when I had not done the memorization. This reflexive process and learning context was heightened since I had transferred from an immersion Lhasa dialect experience in exile to an immersion Amdo dialect experience in Xining — such a difference is similar to that between Spanish and Portuguese — so much so that Lhasa speakers and Amdo speakers use the unrelated but mutually intelligible language of Chinese to communicate between themselves. I did not have this option or luxury since I spoke little Chinese. So before I learned the Amdo dialect, my experience upon transferring to Xining was understanding relatively little of what was said in those early patient interactions and focusing entirely

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[117] རྩ་མདོ། རྩུ་མདོ།

on pulse and urine analysis with each patient before checking the patient file, written in Tibetan, to confirm my assessments. The benefit of this language disadvantage for me in Amdo, was that I had the opportunity to focus exclusively on my pulse and urine assessments and compare it with a patient file without having the input of patients' description of their symptoms and medical history. It was an invaluable diagnostic learning experience.

Tibetan is a di-glossal language such that the written and colloquial forms are almost two entirely different languages. So, though spoken dialects can be highly divergent, the literary form is universal. I learned how the colloquial idioms patients used to describe their symptoms were formalized in the patient files using the literary terms and the classic stanzas and metaphors from the *Four Medical Transmissions* and its commentaries. As I took my notes during diagnostic interactions with patients, I began transferring what I was assessing into these standard indications from the text so as to standardize what I felt with what the text indicated. I found this difficult at first because I felt like I was collapsing the rich descriptions of how much I was feeling in the pulse, seeing in the urine, and so forth, into the more streamlined stanzas. However, I found this approach invaluable. I was most influenced to standardize my notes during my time as an intern with Dr. Namlha Khar. Whenever I asked him about a pulse, trying to add in more descriptive language to explain what I felt, he responded with the classic stanza of the diagnosis. For example, when I would say, "The stomach and liver pulses are protruding

— seems to be friction in the upper gut and liver channels similar to *béken mukpo*." He would respond, "Yup—thick, full and a blind middle finger pulse[118]."

My mentors emphasized the importance of transmission and oral instruction in our education. However, I wondered if feeling my fingers gain "intelligence" when I did recitations before clinic was part of literally feeling the *nüpa*[119]—the potency—transferred from transmission. Various aspects lead to greater *nüpa*—belonging to a family lineage of doctors, having accomplished much meditational practice, receiving transmissions from powerful and realized masters, and the *tsondrü*[120]—diligent perseverance—in study and experience. The words that we recited every day provide a direct link to the Medicine Buddha and the founder of our lineage Yuthok Yonten Gonpo, and all the great masters throughout Tibetan medical history. This rich lineage confers a *nüpa* merely by enacting the text in one's mouth, transmitting the sounds into the environment, and experiencing the text in one's body. This visceral experience invokes priming and fuses semantic and episodic memory, fuses implicit and explicit memory to create enacted cognition.

Conditioning Response

Conditioning response is a form of learning in implicit memory related to priming and procedural memory. Fear conditioning involves the amygdala due to its emotional content; operant conditioning involves the striatum and cerebellum; classical

[118] The stanza reads: བད་ཀན་སྨུག་པོ་སྦོམ་ཁེངས་ཀན་རྩ་ཞར། (TIV, Ch 1:218)

[119] ནུས་པ།

[120] བརྩོན་འགྲུས།

conditioning, sensitization, and habituation involves sensory and motor systems (Kandel 2000:1239).

The brain has evolved mechanisms to detect causal relationships in the environment by associating positively correlated or associated events (Kandel 2000:1242). Some of the associations come from eliciting conditioned responses to various stimuli or associating a pairing of a conditioned stimulus (CS) that initially seems unrelated to another event such as an unconditioned stimulus (US) that normally produces a strong, consistent, overt response. So the appearance of a light when a certain kind of food appears would produce an expectation of the food (US) with the appearance of the light (CS). Eventually, the mere appearance of the light may elicit physiological preparations for the food because of the conditioned response. This classical conditioning has allowed animals throughout evolutionary history to learn to predict events in the environment (Kandel 2000:1240). This can be seen with poisonous foods, creating conditioned taste aversion or what is known as the Garcia effect. Psychologist John Garcia gave sweetened water to rats followed by either no radiation, mild radiation, or strong radiation, and showed total consumption incrementally decreased according to amount of radiation the rat had been exposed to prior (Garcia et al. 1955). The unconditioned stimulus of poison-induced nausea may occur after a long delay of the taste (conditioned stimulus), but eventually a food aversion to the taste will form. This can also occur when patients form aversions to certain foods they had before a chemotherapy treatment session-induced nausea.

As discussed earlier, learning most often has elements of both implicit and explicit learning (Kandel 2000:1244), like driving a car in which the sequence of motor acts initially require conscious execution and eventually become automatic and non-conscious. Similarly, the exposure to facts (semantic learning) will eventually result in instantaneous recall with constant exposure. This occurs with textual recitation in Tibetan medicine and is probably why so many repetitions of the stanzas are required before they become infused into both muscle memory and automatic semantic memory. Although implicit memory is understood to flow automatically whereas explicit memory must be retrieved deliberately (Kandel 2000:1245), from experience with Tibetan medical pedagogy, I argue that there is a point where semantic and episodic memory must become implicit.

Spatial Memory

Our capacity to remember images demonstrates the remarkable function of priming and implicit memory applications. A set of experiments carried out in the 1970s (Foer 2012:26) demonstrated that subjects shown ten thousand images could remember having seen 80 percent of them, contrasting not previously seen images. A more recent study showed that out of 2,500 images, when shown alternative images that were almost identical, such as a green car versus a red car, or a bell with a narrow handle versus a wide handle, subjects remembered 90 percent correctly (Foer 2012:26).

Much of human history relied on the ability to store highly detailed sensory-spatial and visual-spatial memory of the resources needed for survival (New 2007) —

distribution of gathered food resources, trails and home ranges of hunted animals, tracks and territories of predators, locations of water sources and prime firewood, plants suitable for cordage, weaving, and shelter, and so forth. Our brains evolved with the particular functions needed to survive in these environments. The hippocampus may be particularly important for spatial representation and functional imaging of the brain of typical humans, showing that spatial memories involve high activity in the right hippocampus, whereas words, objects, or people have greater activity in the left hippocampus. The right hippocampus is importantly involved in this spatial representation (Maguire et al 1996), whereas the left hippocampus is involved in verbal memory (Kandel 2000:1234). This regional association in our brain may be due to the close connection between spatial memory of food resources and danger and the ability to communicate those locations.

Memory of the spatial architecture of the resources for our sustenance in full sensory experience was critical for our survival. Thus, our predisposition to place information into a spatially rich visualized memory allows us to remember large volumes of information. We have thus evolved multiple systems with multiple functions in which encoding, storage and retrieval must necessarily integrate (Klein 2002). For example, episodic memory alone requires an individual to record events as experienced in a specific space-time matrix from a first-person perspective, and retrieve such events as they are "reexperienced in a quasi perceptual way" (Klein 2002:311). Semantic memory contains general knowledge about the world, but is rooted in episodic memory, or a series of episodic memories in one's life (Klein 2002:311).

Even simple cognitive events can elicit emotional and reflexive autonomic responses. Memories contain episodic components in which the environment, emotional valence and associated physiologic responses are all encoded. Peripheral structures such as the heart, blood vessels, digestive enzymes through the gastrointestinal tract, adrenal glands, sweat glands, and so forth are all implicated in not only present conceptual, perceptual and emotional experiences, but also by those evoked by memory. In Antonio Damasio's somatic markers hypothesis (Damasio 1994), emotions guide behavior and and decision-making, such that a rapid heartbeat is associated with anxiety, nausea with disgust and so forth. Emotions change both body and brain states in response to stimuli, and vice versa, body and brain states can induce certain emotions (Damasio 1994, 2000). Emotional states are mediated by a suite of peripheral, autonomic, endocrine and skeletomotor responses (Kandel 2000:982).

To test spatial memory function, neuroscientist Eleanor Maguire of University College London studied sixteen London taxi drivers (Maguire et al 1996; Maguire et al 2000). Taxi drivers-to-be must spend two to four years memorizing locations and traffic patterns of 25,000 streets throughout the complex and winding throughways of London as well as 1,400 landmarks culminating in an exam called "the Knowledge." Only three in ten examinees receive high enough marks to obtain certification. She studied sixteen taxi drivers by assessing MRIs of their brains. She found that the right posterior hippocampus, particularly involved in spatial navigation, was 7 percent larger than

normal, a finding that demonstrated such training altered the gross structure of their brains, or that drivers with larger brain regions were more successful[121].

In contrast, when Maguire looked at world memory champions (Maguire et al 2002), she did not find increased size in any brain regions compared to the normal controls, but in the fMRIs she did find stronger activation in various brain regions compared to the controls, including the same right posterior hippocampal region as was found enlarged in the London cabbies. From an outsider's perspective, the memory champions were not navigating; they were simply remembering shapes, words and numbers. However, when asked what they were doing, the memory champions explained that they were distributing the objects to be remembered along familiar spatial journeys. So even though the memory champions did not score outside of normal ranges on the various general cognitive ability tests that Maguire and her team administered, they were drawing upon the spatial memory functions of their brain differently than the norm to be able to achieve greater memory capacities.

The tasks we use our memories for these days, such as remembering large volumes of information to perform on written examinations characteristic of majority standard education or the inundation of input sources of 'need-to-know news' in this information age, were not very relevant for the tasks our memories evolved to handle. Humans perform well at remembering visual imagery (e.g., two-picture recognition test), but not at remembering other kinds of information like words, numbers, sounds, smells and so forth. I thought memorizing large volumes of text would feel strange, foreign, and

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[121] The introduction of GPS has eliminated the need for this spatial memory skill among London cabbies.

impractical. However, it felt like I was connecting with something humans have done for a long time—longer than current education practices. The long hours of memorizing, reciting, contemplating, applying the stanzas to experience felt familiar to me, like my brain had the capacity to do it in a way I never thought possible. It felt easier than it should have, and oddly familiar. I have always been a visual-spatial learner.

My high school advanced placement physics teacher Steve Haas conducted research on visual-spatial learners on the side. He recognized me early on as a visual-spatial learner. Growing up, I had no idea that I learned differently than others in my classes. I knew I had an aptitude for math and science as well as a significant artistic side, which seemed unusual among my group of friends. However, I did not know it could be a different approach to thinking and learning altogether. I felt relieved to meet a teacher who understood my thinking processes and problem solving approaches. He asked me to visualize physics problems instead of just work through the mathematics. I told him that I did not know how to do a physics problem without visualizing. The images in my head arose simply when trying to think through the problem. “It’s actually the way most indigenous populations think,” he said, “We’ve moved away from that type of learning in our contemporary societies, but it comes naturally to many if properly encouraged young,” he said.

Even though he studied physics at Stanford, his first career after college was as a diplomat for the State Department in Romania. When I met him in Colorado, he had made a career switch to return to physics and teach high school so he and his wife could raise their kids in the US. When his children entered college, he was able to pursue his

interest in researching and teaching visual-spatial learning. He began conducting workshops for tribes in the U.S., New Zealand and Australia (Haas 2001, 2011a, 2011b, 2014; Lassos & Haas 2016). I was fortunate to have teachers throughout my education who were innovative educators and sought to teach to all learning styles of students. My geometry teacher in high school had us re-developing classic proofs and building Platonic solids in class. She encouraged us to bring unusual snacks since she said taste and smell solidified memory.

Mr. Haas encouraged me to use unconventional methods to think through problems, not always stick to the way we were taught in class, but explore what visualizing the problem would do to "seeing" solutions. It expanded the possibilities of how I approached my learning in all my classes. I felt that I had a tool for learning which I had not fully explored. Later, when I studied animal tracking and wilderness survival, I felt these learning skills come alive in my mind. Where resources are on the landscape, where I saw a certain line of tracks, a smell of the soapberry bush that I had not visually noticed but remembered where I smelled the distinctive saponin odor— all were distributed in my mind like a massive map that I had made personal associations with in all my wanders and explorations.

Later, when I was exposed to the concept of *maṇḍalas* in Tibetan Buddhism, the value of the visualized memory mapping technique was clear and felt practically familiar.

Visual Memory & Encoding the World

Sensory perception cannot faithfully record the external world. Instead, it is a selective, constructive process that uses narrowly focused receptor-detectors and specific rules in the brain's afferent pathways to gather and put together the incoming information (Kandel 2000:1239).

Damage to the hippocampus suggests that this structure is just a temporary way station for long-term memory. Likewise, it is a way station for the various associative parts of given sensory data.[122] The unimodal and multimodal association areas of the cerebral cortex initially process sensory information and are also later implicated in long-term memory storage of episodic and semantic knowledge (Kandel 2000:1233). Without appropriate conditions, sensory information is lost and never makes it to long-term memory. This means specific conditions must be in place to move textual memorization in Tibetan medicine into long-term memory, as well as to fuse sensory information to those understandings provided by the text into long-term memory as well. The hippocampus may serve to bind together these various components of richly processed memory of perceptual data, such as looking at someone's face, a patient's constitution, a sample of urine, and so forth, and the explicit memory content of what that perceptual data means diagnostically.

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[122] The cerebrocortical areas devoted to processing visual information include the unimodal visual association area in the inferotemporal cortex, which is specifically dedicated to face recognition (Kandel 2000:553,1233). This visual information is simultaneously conveyed through the mesotemporal association cortex to the parahippocampal, perirhinal, and entorhinal cortices, and from there through the perforate pathway to the hippocampus. Over a period of days or weeks, the hippocampus acts in conjunction with the rest of the medial temporal lobe to facilitate storage of the information about the face initially processed by the visual association area of the inferotemporal lobe (Kandel 2000:1233). Likewise, specific cells in the visual association cortex concerned with faces interconnect with other regions thought to store associative knowledge about the person whose face is seen, connections which are also likely modulated by the hippocampus (Kandel 2000:1233).

Semantic memory is also recruited in the memorization and recitation process because the text interlaces terms, definitions of terms and their defining characteristics that are employed in developing the medical theory throughout the *Four Medical Transmissions*. The presentation of terms and their definitions is also a key tool used in dialectical debate. The reification of terms, their definitions and their attending concepts allow the analytical process of debate to demonstrate how those concepts are constructed for conventional use. One can imagine that the layering of metaphorically rich stanzas that induce visual and sensory imagery about diagnostics, causes, and conditions, integrate with the memories of conceptual meaning, or semantic memory, to create increasingly complex cognitive data over time. The input of sensory-perceptual data into the hippocampal system mediates initial steps of long-term storage, and slowly transfers information into the neocortical storage system. This relatively slow addition of information to the neocortex permits new data to be stored in a way that does not disrupt existing information (Kandel 2000:1233). If the initial metaphorical imagery induced in the minds of Tibetan medical students through the process of memorization and recitation of the text provides the basis that later clinical experience and patient cases enrich, then the textual metaphors will provide foundations upon which new data builds instead of new data rewriting the initial foundations.

Neuroscientists have described the organization and flexibility of semantic memory itself as both remarkable and surprising. For example, consider the visual image of an elephant. Through presentation of images of an elephant, experience, and conceptual descriptions of elephants and their behavior over time, we can close our eyes

and conjure up the image of an elephant with rich representation in all sensory fields, including smell, sound, and tactile associations. The more associations we have made to the image of an elephant, the better we *encode* that image, and can recall the features of an elephant at a future time. Now think of a concept like *tripa* in Tibetan medicine. Initially, nothing of conceptual significance may come to mind except associations you may have with the sounds of the syllables when you here it named. You are told that it is one of the functional energy systems in the body related to heat and metabolism, that it drives digestion and the distribution of nutrients from the gastrointestinal tract to all their respective organs, tissues and cells as necessary metabolites. You are told that *tripa* is the minute heat produced by each mitochondrial powerhouse in every cell. It is also the heat carried in blood, the constituents that comprise one's complexion, the pathways that regulate temperature throughout the body. These associations begin to build into, not only the term *tripa*, but also a visual, experiential concept in your mind.

Furthermore, as you experience foods said to raise *tripa*, you literally experience your body heat increase. One day you get a fever and come down with the flu, and experience *tripa* when it becomes dysfunctional, imbalanced. You feel how applying heat will worsen the fever, and the kinds of foods that reduce your temperature. When you take certain herbs indicated at decreasing *tripa* heat, you feel how the medicine moves through your system, the release of headache around the bones of the eyes, the release of tension in the upper back, the re-moistening of your mouth, and the rejuvenation of your complexion. Now, *tripa* has gained further layers of meaning beyond the semantic. *Tripa* is encoded with episodic memories, concrete experiences in time and place in your body.

Furthermore, your experiences and the conceptual learning are blended such that implicit and explicit memories related to *tripa* start to form a mesh of meaning, experience, and an instrumental form when someone says "*tripa*." Physiologic functions, diseased states, and medicinal plants related to *tripa* all begin to relate to conceptual and experiential knowledge, felt in the body, and felt in the body of others as you start to feel what a *tripa* pulse under your fingers is when a patient is experiencing systemic heat. The concepts and percepts blend to form an enacted cognition of what *tripa* is.

Brain Development, Neuroplasticity and Memory Capacity

Developmentally, the brain reaches 90 percent of its adult size by age six, then undergoes another wave of growth and maturation during the second decade[123]. At this time, gray matter, which is responsible for processing information and storing memories, increases in size, especially in the frontal lobes, and increases synaptic connections between neurons. At this time, pruning, which reduces synaptic connections, begins, at around age eleven in girls and age twelve in boys, and continues until the early or mid-20s, especially in the prefrontal cortex, which is associated with planning, reasoning,

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[123] Four landmark studies in the late 90s (two cross-sectional, two longitudinal) used sophisticated processing of MRI scans to demonstrate significant brain maturation during adolescence and early adulthood (Giedd et al., 1999; Paus et al., 1999; Sowell et al., 1999; Thompson et al., 2000). Additional longitudinal studies using MRI have continued to contribute to our understanding of brain development in healthy individuals (Sowell et al., 2004; Lenroot et al., 2007) (Lebel & Beaulieu 2011). As Lebel & Beaulieu describe: "Sensitive imaging methods such as diffusion tensor imaging (DTI) demonstrate much more widespread changes than conventional MRI in cross-sectional populations. DTI has shown increasing fractional anisotropy (FA), a parameter linked to axon packing and myelination (Beaulieu, 2002), and decreasing mean diffusivity (MD), a parameter reflecting water content and density, throughout brain white matter during childhood, adolescence, and into young adulthood (Mukherjee et al., 2001; Schmithorst et al., 2002; Barnea-Goraly et al., 2005; Ashtari et al., 2007; Bonekamp et al., 2007; Eluvathingal et al., 2007; Lebel et al., 2008a). In general, maturation of commissural and projection fibers occurs earliest, while association fibers continue maturating at later ages, and frontal-temporal connections demonstrate the most prolonged development" (2011:10937)

judgment, impulse control and working memory. Connections that are rarely used are pruned (Giedd 2008), making the brain more efficient and allowing it to change structurally in response to environmental demands (Spear 2000). Pruning also allows for different regions of the brain to gain greater specialization (Casey 1997), which may be particularly useful in these rigorous training periods of high volumes of textual memorization. Cognitive development is associated with pruning synaptic connections and increasing the fatty, insulating material that coats axons of nerve cells called myelin. Myelin improves nerve cells' ability to conduct electrochemical signals and those connections that have survived pruning function more efficiently. This myelination continues into adulthood, particularly in areas of the brain such as the frontal and prefrontal cortices (Rubia 2000; Sowell 2003), and may not reach its full maturation across the brain till the mid-40s.

According to longitudinal neuroimaging studies, the most significant neuromaturation of the brain continues well into the early 20s (Johnson 2009). Specifically, association fibers continue maturing at later ages of brain development with the frontal-temporal connections experiencing the most prolonged development (Lebel & Beaulieu 2011:10937)[124]. Although work in neuroplasticity demonstrates the ability for individuals well into adulthood to continue learning languages and other capacities that significantly recruit working memory centers, the developmental trajectory provides a natural asymptote for which rigorous training in a skill that extensively uses working memory would have an age limit.

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[124] Change within individuals is still not well-understood.

Frontal lobe neural circuitry, which includes working memory centers, may not be fully developed until the mid-20s (Sowell 1999). Thus, it may indeed be true that there is an age cutoff in Tibetan medical education beyond which one's mind is not sufficiently supple to upload memorized text into one's head and reproduce it at the drop of a hat.[125] Similar to when Khenpo Tsultrim Lodrö explained the seven-year meditation path of study at Larung Gar Serta Monastery in Kham (2016), which also requires preliminary years of significant memorization, Tibetan monastic students need to complete most of their memorization and scholastic studies before age 25 because the mind is supple and can engage in the required analyses of logic bases. After age 25, he described, not much productivity in memorization and scholastic studies can be gained.

In contrast, Buzan argues that our assumption that memory decline is a function of age is incorrect. This has become a normal phenomenon because we do not develop our memories and brains societally, and we do not participate in brain health-promoting diets and lifestyles (Foer 2012:13). Although this may be true to some extent, the larger developmental processes seem to indicate a general tapering of memory capacity at the end of the adolescence period. However, since most societies no longer make use of their memories in the way many cultures have historically, Buzan's assertion may be partially true. Recently, various memory therapies have been developed for Alzheimer's and progressive dementia patients (Foer 2012:12).

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[125] I was told that I was much beyond the acceptable age limit for a student entering Men-Tsee-Khang. I knew I had other classmates who were on the older side, who often "adjusted" their personal documents to qualify for being under the age limit. However, it seems I was several years older than even them. I was at least ten years older than the majority of my classmates, including Inga.

Konner speaks about this concern in Western medical education. He describes Western medical pedagogy as ignoring "a hundred years of systematic quantitative study of human memory" by delivering enormous amounts of information to medical students, for which they cannot possibly retain even a fraction (Konner 1987:14). Many of the faculty both at MTK and SLL lobbied to reduce memorization loads on the students. Particularly the younger faculty noted the need for better comprehension of the "meaning" of the text. One of my professors at SLL even said, "We all forget the stanzas in later years anyway. Why put so much effort on performing the Three Transmissions?" Reflecting on these statements now, it makes me wonder if they realize the benefits of memorization. Perhaps they take them for granted? Or perhaps not everyone experiences the value of memorization and recitation? This latter possibility seemed less likely, especially considering the way senior physicians constantly quoted the text and used metaphors throughout their teachings and explanations. They demonstrated an intimacy with the text that can only come from the many hours of memorization, recitation, contemplation, and experience.

During my sessions with Amchi Yeshi Dhonden and his nephew Kalsang Dhonden, for the series of interviews in producing his biography, Amchi Yeshi Dhonden said, "Tibetan medical education is not what it used to be. Students are not what they used to be." I asked him to elaborate further. "They don't work as hard. They're not expected to know as much, do as much, memorize as much, be skilled as much," he responded. I mentioned the extensive amount of time it takes to memorize the texts. "Yes," he said, "But when I was at Lhasa Mentsikhang, we would memorize early in the

mornings, see patients with our teachers through mid-morning, then taking class in the afternoon, compounding medicine in the late afternoons, and then memorize again in the evenings. We did it all — and memorized more." Though I was daunted by adding any more pressure to the memorization loads I already felt, I yearned for this integrated form of education that Amchi Yeshi Dhonden described as the norm at Lhasa Mentsikhang during his time there.

Cognitive Efficiency

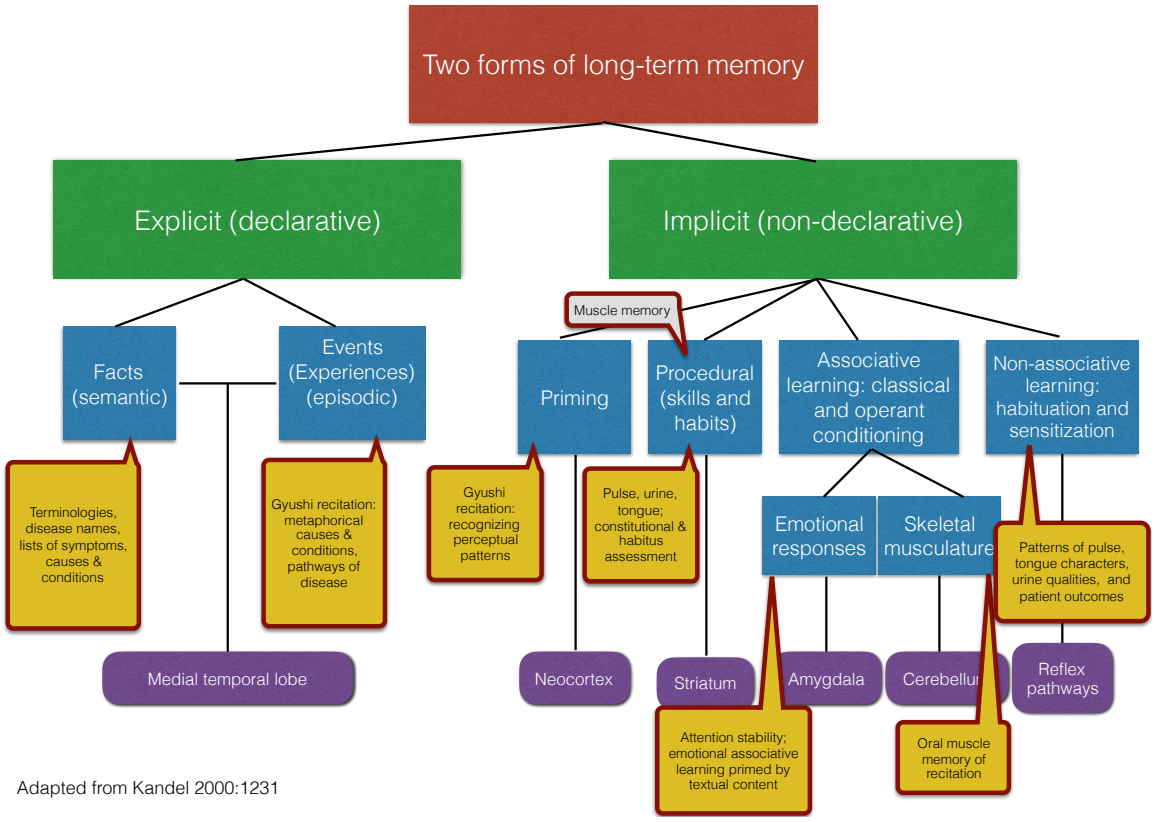
Cognitive efficiency is the ability to recall and use knowledge (Kandel 2000:1236). It is the capacity of the mind to organize information according to memorized categories and topics interlaced with rich metaphors, which allows for ease in recall and employment clinically. Studies of patients with damage to association cortices show that different representations of objects are stored separately. Thus, our experience of knowledge as a seamless, orderly and cross-referenced database is an artificial experience stemming from the product of integration of multiple representations in the brain across different anatomical sites, each concerned with distinct aspects of a given concept. Likewise, any time something is remembered, the recall is built from the various bits of information stored in distinct memory stores or regions (Kandel 2000:1236).[126]

[126] For example, damage to the posterior parietal cortex can result in patients identifying objects by selecting correct drawings and reproducing details but not being able to name the objects. Whereas damage to the occipital lobes and surrounding regions allows patients to name objects but they cannot draw the objects (Kandel 2000:1236).

Summary of Memory Processes and Tibetan Medical Pedagogy

In the preceding sections, I have outlined the various memory processes understood by cognitive neuroscience and how they apply to the context of memorization, recitation, visualization and clinical experience in Tibetan medical pedagogy. The diagram below summarizes these relationships.

Diagram 4. Tibetan medical pedagogy as related to long-term memory processes



Adapted from Kandel 2000:1231

Limitations of current research on memory

The study of memory was first brought into the laboratory in the 1870s by Hermann Ebbinghaus (Foer 2012:17). Research on memory has been limited almost exclusively to accounts focused on explaining simple laboratory paradigms (Rubin 2006),

targeting image, word, and number recall applications of memory. For example, this extends into societal perceptions of memory performance in, for example, memory competitions. The World Memory Championship includes ten events called "disciplines" in which participants memorize: 1) a previously unpublished poem spanning several pages, (2) pages of random words, (3) lists of binary digits, (4) shuffled decks of playing cards, (5) a list of historical dates, (6) names and faces (Foer 2012:120). Other competitions pose similar tests, giving the participant five minutes to study the content and then assess: digit span recall, lists of binary digits, historical dates, spoken numbers, word lists, images and names, fifteen minute poems, speed cards, speed numbers, random numbers, trivial pursuit-like skills of general knowledge, rotating cubes in one's mind's eye, and definitions. These are the most common public assessments of an individual's memory function and capacity (Foer 2012:58-60).[127]

The practice of imbibing large volumes of text into memory for daily application has not been preserved in Western society, so the study of memory does not look at such applications. More complex theories are needed to explain richer forms of memory such as autobiographical memory and oral history, or for instance, oral literate recitation traditions as in Tibetan medicine. Psychologist and autobiographical memory specialist David Rubin (2006) has proposed Basic Systems Theory to address complex memory

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[127] The memory functions of memory championship winners have been minimally studied. However, memory champion Ed Cooke describes his own inquiry as a cognitive scientist into the capacities of human memory (Cooke 2008). He said there are two ways to figuring out how memory works, "The first is the way that empirical psychology does it, which is that you look from the outside and take a load of measurements on a load of different people. The other way follows from the logic that a system's optimal performance can tell you something about its design. Perhaps the best way to understand human memory is to try very hard to optimize it—ideally with a load of bright people in conditions where they get rigorous and objective feedback. That's what the memory circuit is," referring to the memory competition circuit (Foer 2012:15).

systems that integrate multimodal components from vision, audition, action, space, affect, language and so forth, and in which retrieving a memory involves concurrent simulation of the multimodal components. Such an approach engages grounded cognition, which I will discuss shortly.

Metaphor

Language has played a major role in human evolution and is a distinguishing feature of our species (Hauser, Chomsky & Fitch 2002). Likewise, nonverbal and body language communication also serves a strongly adaptive function (Tomasello 2008). As a species that relies extensively on our visual sense, introducing visual representations to facilitate the understanding of symbols, metonymies and comparisons would facilitate a natural evolution of metaphoric language (Domínguez 2015). Furthermore, the ability to assimilate, understand and employ metaphoric and abstract language would unite a group (Quinn 1991; Skott 2002) in what Johnson has called a "shared understanding" of concepts and propositions within a linguistic community (Johnson 1987:206) and confer an adaptive advantage in group selection (Forceville et al. 2006).

Metaphor has been a key area of research that has illuminated the role of the body in shaping the mind as well as in thought processes and conceptual experiences. It provides a framework from which we can understand embodiment — the way body affects mind, and the impact of mind on body — and the role of culture, language and experience in forming these metaphorical relations (Boroditsky 2000). Recent work suggests that conventional and systematic metaphors influence the way people perceive

the world and reason about core issues in their life (Thibodeau & Boroditsky 2011, 2013, 2015), and provides a fundamental structure through which people conceptualize their world, their own activity, and their internal embodied simulation of experiences (Gibbs 2006, 2008, 2011). Metaphor has been proposed as an essential part of human thought (ibid). Recent work has also suggested that metaphors lead people to "follow different paths of inference" (Thibodeau & Boroditsky 2015). Metaphor is a mechanism that influences motivational states and paradigms in the applied conceptual domain (Ottati et al. 1999; Landau et al. 2009).[128] It can influence self-concept as well as body-concepts, mind-concepts and so forth (ibid).

Opposing perspectives on the significance of metaphor were proposed by two major contemporary American philosophers: Donald Davidson, who claimed that metaphors are meaningless, and John Searle, who claimed that there are semantic and pragmatic principles that allow one to assign literal meanings to metaphorical sentences (Lakoff & Johnson 2008:271). The arguments of these two philosophers rest on common assumptions held in analytic philosophy throughout the Western tradition that "concepts are all conscious, literal, and disembodied, that is, not crucially shaped by the body and brain"[129] (Lakoff & Johnson 2008:271).

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[128] Steen and colleagues found no effects of metaphorical frame on reasoning in political contexts, recommending the need for establishing more precise boundary conditions under which metaphors do or do not impact reasoning and acknowledging the dimensions in which they vary such as novelty, artful deviation and deliberateness (2014:22). Deliberate metaphors such *A is B* metaphors and extended metaphors, such as the metaphorical support, can enhance metaphorical processing (Bowdle and Genter 2005; Steen 2008, 2011; Ibáñez & Hernández 2011). Metaphorical frames are seen as more persuasive if they refer to self-relevant motives (Landau et al. 2009). They also point out that Thibodeau and Boroditsky (2011, 2013) suggest that metaphorical framing works unconsciously; however, the recent work indicates that metaphors are more persuasive when they are actively recognized as metaphors (Steen et al. 2014).

[129] Although Lakoff and Johnson's Philosophy in the Flesh (1999) was the first major attempt to counter these assumptions.

Since our spatial concepts arise from constant spatial experience and our interaction with our physical environment, metaphors structure the minutiae of our conceptual understanding of the world (Lakoff 1987; Lakoff 1991; Kövecses 1986, 1990; Meier et al. 2007; Lakoff & Johnson 2008; Thibodeau & Boroditsky 2011, 2013, 2015), including health and illness. As George Lakoff and Mark Johnson describe in *Metaphors We Live By, "*Metaphor is one of the most basic mechanisms we have for understanding our experience," in which "[t]he nature of our bodies and our physical and cultural environment imposes a structure on our experience, in terms of natural dimensions" (2008: 211, 230). Even the very basic spatial concepts of "front", "back", "up", and "down" demonstrate the role of embodied experience in our conceptualization (Lakoff & Johnson 1999; Wilson & Foglia 2017). They liken metaphor to a primacy in human experience:[130] "It is as though the ability to comprehend experience through metaphor were a sense, like seeing or touching or hearing, with metaphors providing the only way to perceive and experience much of the world. Metaphor is as much a part of our functioning as our sense of touch" (ibid: 239).

Metaphor is also a neural phenomenon in which sensory-motor regions are activated and recruited for use even in abstract thought. Since our brains are embodied, our metaphors will reflect our commonplace experiences in the world. Various primary

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[130] Lakoff and Johnson (2008) locate the theory of metaphor within the Neural Theory of Language (Feldman 2006). They describe the advantages in such an approach: (1) Gaining an explanation via embodiment for how primary metaphors are learned: universal primary metaphors arise from universal primary experiences; (2) Gaining an explanation for why metaphorical thought exists and why it is normal and inescapable: the regular co-activation of two domains results in the recruitment of neural circuitry linking them; (3) No theory of overrides is necessary; (4) Metaphors fit naturally with the best of the Neural Theory of Language; (5) Neural enactment provides a mechanism for characterizing the dynamic use of metaphor in context and in discourse; (6) Since the Neural Theory of Language comes with explicit computational models, there is an explicit computational account of how metaphors operate dynamically. (Lakoff & Johnson 2008:259).

metaphors stem from the universal experience of living in bodies and brains in environmental contexts — similar experiences as far as metaphor is concerned (Lakoff and Johnson 2008:256). For example, the metaphors we use for anger have arisen from the physiological experience of anger. Across languages and cultures, the metaphors used have similar phenomenological descriptions (Lakoff 1987; Lakoff 1991; Kövecses 1986, 1990; Meier et al. 2007; Thibodeau & Boroditsky 2011, 2013, 2015), as with descriptions of emotions such as anger, "She exploded in anger."

Tom Weisner (1996, 1997) has developed tools for understanding these dynamics in psychocultural research with his development of ecocultural theory. He argues for understanding the central role ecological orientation plays in child development, where not only life histories are built, but the "meanings and logic that animate them" as well (Worthman 2010:553; Weisner 2002). He describes the cultural ecology of emotion and arousal regulation, as with stress (Axia & Weisner 2002), where concepts of stress and accommodation are invoked within this specific cultural ecology. Biological anthropologist Melvin Konner has furthered such a model by integrating cognitive-psychological and ethnographic orientations to further this approach (Konner 2002). He provided a synthesis of the early work done on the evolutionarily generated, genetically guided maturational plan that biologists and psychologists use widely today with the understandings of cognitive development that Piaget and others pursued, and integrating neural and neuroendocrine development in light of evolution to sketch a species-specific pattern of biosocial growth for humans (Konner 2002:617-8). In a bioecocultural approach, as Worthman states, "the developmental microniche comprises the zone of

proximal development representing the lived experience and actual operating conditions of the child *in relation to* the child's characteristics and capacities" where "momentary and ongoing sum of fit, affordance, and burden between the developmental niche (resources, demands, experiences) and the child's needs, capacities, and sensitivity to environmental input (endogenous factors)" allow for the processes of embodiment to take place in this inside-outside dynamic developmental and life-long engaged process (original italics, Worthman 2010:555).

"Neurons that fire together wire together" (Hebb 1949),[131] so neuronal activation occurring simultaneously in two separate parts of the brain, such as those devoted to emotion and those devoted to temperature, co-constitute affect and physiological experience. For example, the "affection is warmth" metaphor stems from the physiological raising of body temperature during experiences of affection and the lowering of body temperature during feelings of fear or ostracization (Williams & Bargh 2008). Researchers have identified involvement of the insula in processing both physical temperature and interpersonal warmth (trust) information (Williams & Bargh 2008: 606). This work further demonstrates the contemporary work of cognitive linguists showing that "people conceptualize their internal mental worlds by analogy to their physical world" (Williams & Bargh 2008: 606; Mandler 1992; Sweetser 1990; Johnson 1987;

[131] Initially proposed in Donald Hebb's 1949 proposal of coincident-based synaptic plasticity.

Talmy 1988; Clark 1973).[132] Furthermore, embodiment theorists note how objects and events that produce the same quality of affective response are categorized, or associated, together in memory (Niedenthal et al. 1999). They describe how a warm beverage may trigger feelings associated with affective warmth (e.g., trust and comfort) because of early experiences associating caretakers with warmth, shelter, safety and nourishment (Williams & Bargh 2008:606). This furthers theories of basic human experiences and phenomenologies shaping how metaphors develop and further shape perceptions. The link between tactile temperature sensations and feelings of psychological warmth and trust across primate species (Insel & Young 2001) shows that the insular cortex is implicated in the processing of both the physical and psychological valences of warmth information (Meyer-Lindenberg 2008). The insula is implicated in feelings of trust, empathy and the social emotions of guilt and embarrassment (Williams & Bargh 2008:606). We see this play out in Tibetan medical treatments when *rlung* imbalances characterized by anxiety, social isolation, and mental instability (which also manifest

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[132] Piaget's (1952) theory of sensorimotor development has provided the most widely accepted characterization of how concepts are first acquired in psychological research (Mandler 1992:588). He describes how an infant up to the first 18 months of life is focused on developing perceptual categories of objects. Piaget acknowledged that these categories need not be conceptual, and likely were primarily sets of perceptual-motor schemas (ibid). The sensorimotor schemas become internalized freeing up ongoing perception and action for other objects and interactions. Despite the critical response to other aspects of his theory, his sensorimotor stage in infancy has remained widely accepted (Mandler 1992:588). However, like Dharmakīrti's theory of pramāṇa, Piaget does not provide a robust account of how perceptions become concepts. Symbolic functioning in early development has been shown with sign language acquisition as early as six to seven months (e.g., Bonvillian et al. 1983; Meier & Newport 1990). Mandler (1988) has proposed that perceptual analysis is the mechanism by which concepts are first formed, which is consistent with the analysis of perceptual aspects providing content for inferential judgments (which are inherently conceptual) in Dharmakīrti's theory. Vygotsky's zone of proximal development (ZPD) (1978) also uses a similar approach by associating proximal perceptions with the judgments that form concepts, which has been implemented through cross-cultural psychological research by the Whiting model (Whiting et al. 1979) (which Super & Harkness (1986) provided a substantial expansion in terms of the developmental niche), which looks at the proximal envelope of conditions and experiences that children in a population are likely to encounter (Worthman 2010).

often as neuromuscular disorders) are treated with warming foods, liquids and therapeutic treatments.

The hot-cold dimension plays a major role in Tibetan medical diagnostics, since all disorders can be classified in their most basic form as a hot disorder or cold disorder. In psychological research, as early as mid-20th century, Solomon Asch demonstrated the transformational power of "warm" and "cold" as personality traits in first impressions of individuals, such that it has been a prominent feature of research on social perception and interpersonal liking (Nisbett & Wilson 1977; Cuddy et al. 2008). Asch was interested in immediate perceptual experience and the phenomenal experience of the perceptual object (Leyens & Corneille 1999). Along with competence, the warm-cold dimension has emerged as one of two main components of first impressions we form of other people (Cuddy et al. 2008; Fiske et al. 2007), accounting for 82 percent of the variance in people's evaluation of social behaviors (Wojciszke et al. 1998) across cultures and populations (Cuddy et al. 2008; Fiske et al. 2007). Through encounters with conspecifics, social animals must determine whether the 'other' is friend or foe and to what degree the 'other' has the ability to enact those intentions (Fiske et al. 2007). Thus, warmth and competence elicit uniformly positive emotions and behavior (ibid).[133] Approach-avoidance behavior results from these initial perceptual judgements (Wojciszke et al. 1998). Thus, the basic phenomenological experience of temperature influences both physical experience as well as socioemotional relations, providing a structure to

[133] Those who are perceived as high on one dimension and low on the other dimension elicit "predictable, ambivalent affective and behavioral reactions" (Fiske et al. 2007:77).

understand Tibetan medicine's systematic linking of physical and mental symptoms associated with "hot" disorders and "cold" disorders.

Complex metaphors draw upon primary metaphors and make use of culturally- and linguistically-based conceptual frames, which we see in the work of cognitive scientist Lera Boroditsky. She has looked at how culture and language shape conceptualizations of time and space (Boroditsky 2000). These complex metaphors differ significantly from culture to culture because of the cultural information they integrate (Lakoff and Johnson 2008:257). Metaphor blurs the distinctions between semantic and episodic memory. The dual engagement with these two types of memory is important to the Tibetan medical context with memorization of vast amounts of text, the encoding of metaphors and the deployment of this embodied knowledge in a clinical context. In the case of Tibetan medicine, most of the metaphors in the Four Medical Transmissions refer to basic physiological systems and pathways. These are primary metaphors applicable to all human biologies. Other secondary metaphors are also used which build on the more basic metaphors to create higher organizational structures within the medical system.

The definitional characteristics of the *nyépa rlung* provides an example of primary metaphors:

> *rlung gi tsen-nyi tsüp jing yangwa dang; drang zhing tra-la sa zhing yo-wa yin*[134]
> *Rough and light. Cold; subtle, hard, and mobile —these are the definitional characteristics of rlung.*

The definitional characteristics of each *nyépa* are important primary metaphors in Tibetan medicine that characterize the physiological pathways of each *nyépa*, the causes and

[134] རླུང་གི་མཚན་ཉིད་རྩུབ་ཅིང་ཡང་བ་དང་། གྲང་ཞིང་ཕྲ་ལ་སྲ་ཞིང་ཡོ་བ་ཡིན།

conditions that exacerbate each *nyépa*, and even the activities of a given medicine that treats a *nyépa*'s imbalance. While reciting the text, I found myself contemplating the metaphorical characteristics and how these characteristics apply to various contexts. When I drank coffee, which is rough, light, cool, and astringent, causing *rlung* to increase, I observed how my body responds. I could feel a downward movement at the pelvic-sacral region, characteristic of the downward-voiding *rlung,* practically resulting in a bowel movement. My heart and chest felt more full, giving me confidence and drive, a quality of greater activity in all-pervasive *rlung,* which resides at the heart. I felt my upper crown feel taller, a quality of greater flow in the life-wind *rlung* of the central channel. The activities of black tea and green tea seemed quite different. Black tea felt it acted more subtly on the lower region of my body, where downward-voiding *rlung* resides, and likewise had less activity in inducing bowel movements. It also seemed to mobilize the upper gut area, where fire-accompanying *rlung* resides, which makes sense since it is sweeter in taste than coffee and less rough and light, easier on digestion. I experienced green tea in my upper body, almost exclusively as a buzz in my head. It also seemed to mobilize my respirations more than either coffee or black tea. I could see how their different qualities related accordingly to *rlung* function differently. I found this interesting since the focus in the West tends to be primarily their caffeine content and anti-oxidant qualities. However, their physiologic effect—what I might assume we would link to their caffeine activity primarily—seemed distinctly different in where and how it acted on the body.

Examples like this were common in how I interacted with the text and how I related the text to what I saw in a patient. I found these individual explorations differed among my classmates. At Men-Tsee-Khang we collected everyone's urine and tested each other on what qualities we observed and discussed our own experiences about certain foods we had just eaten or experiences we had that influences the *nyépas*. We tried to trick each other by putting apple juice, sodas or other urine-like liquids in the bottles we took to class to assess. Gen Khenrab chided us, "You have to investigate. You cannot rest. There is constant learning in what you eat, how you feel, what you do, how you think — it all changes your urine, your tongue, everything that we use for diagnostics. You have to constantly question in order to learn." At SLL, Gen Samdrubjial also brought urine into class and had students take one another's pulses. Personalities factored in to how much each person explored. Some were more curious than others. Some were louder than others, but clearly had not taken time to look. Others were quiet and shy, but had clearly spent quality time observing a bottle of urine or taking a pulse. We were asked, what does *rlung* feel like in the body? What does it look like in a patient's urine? How does it manifest in pulse? How can you recognize a medicinal plant that will proliferate *rlung* or diminish its aggravation in the body?

Since the *nyépas* are central concepts and organizing principles in Tibetan medicine, their definitional characteristics are re-visited in almost every chapter of the *Four Medical Transmissions*. One is prompted to reflect on them as being understood according to the qualities of their elemental components, such as how the internal physiologic motility is related externally to environmental winds for the term *rlung*. The

internal and external representations are understood as embodying the same qualities in the body, such as motility along pathways such as those of the neuroendocrine system, or externally, such as the motility of pressure systems, thermal waves, aerosolized particles, and humidity. Since *nyépas* simply describe pathways, that can be functional or dysfunctional trajectories. In the chapters in the *Four Medical Transmissions* on behavior as well as pathological conditions, one sees how the characteristics of each *nyépa* respond distinctly to different seasons and qualities depending on the etiological causes and conditions.[135]

For example, in the case of relating seasonal influences to *rlung*, early summer[136] has the predominant qualities of lightness[137] and roughness[138]. Such qualities are further enhanced by similar qualities of place, constitution, diet and lifestyle. Thus, *rlung* will accumulate during this season, but not fully manifest because the prevailing warm quality of the season counters the cold quality of rlung and keeps it in check. The summer season is characterized by rain which raises the cold quality in *rlung* and causes *rlung* disorders to manifest. Autumn has greater oily and warm qualities and will naturally pacify most *rlung* disorders.[139][140]

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[135] གསོ་ཐག་ལྡང་ཞི་གསུམ་རྒྱུ་དང་དོ་བོ་དུས། (TII, Ch 9: pg 74)

[136] སོ་ག

[137] ཡང་བ།

[138] རྩུབ་པ།

[139] The full passage reads: སོ་གའི་དུས་སུ་ཡང་ལ་རླུབ་པ་ཡི། ཡུལ་དང་ལུས་དང་ཟས་སྤྱོད་ཀུན་མཚུངས་པས། རླུང་གསོག་བྱེད་ཀྱི་དོ་བས་ལྡང་མི་འགྱུར། དབྱར་དུས་ཆར་རླུང་གྲང་བ་སྐྱེས་པས་ལྡང་། སྟོན་དུས་སྐྱམ་ལ་དོ་བས་ཞི་བར་འགྱུར། (TII, Ch 9: pg 75)

[140] The seasons are presented as one would experience the seasons in Tibet, with some influence from how seasons reengaged and their effects are conceptualized from the India context.

Likewise, for a given cause, such as diet, lifestyle, or treatment, characteristics that exacerbate *rlung*'s defining characteristics will cause a rise in *rlung*, but can be held at bay with warm qualities. In contrast, cold qualities will cause *rlung* disorders to manifest from the dietary or lifestyle influence. For example, the text reads:

> A cause with a rough quality that is taken along with that with a warming quality, will cause *rlung* to accumulate. With a cold quality, *rlung* will manifest; and with oily and warm qualities *rlung* is pacified.[141] (TII, Ch 9: pg 74)

In these stanzas, cause[142] refers to food, medicine, behaviors, environment, social relations, mental thoughts—anything that can cause a disruption in the *nyépa*. Thus, these metaphorical cues are central to understanding how the *nyépa* are defined, how they function in the body and how they become imbalanced and, thus, the source for disease. Likewise, these metaphorical cues are central to understanding how to diagnose the *nyépas* because the same qualities appear in pulse, urine, tongue and even constitution. In the same vein, cues are central to understanding the proper treatment because the medicine and all therapies are classified according to these qualities that one applies in treating the *nyépas*.

In reciting the stanzas during four years of coursework and still to this day, I find myself contemplating the experience of *rlung*, *tripa*, *béken*, blood and *chu-ser* in my own body—how various foods raise *rlung* or cause it to calm, how exposure to certain environments raise my *tripa*, or how certain mindsets cause *béken* to accumulate in my

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141 The full passage reads: རྒྱུ་ནི་རྩུབ་སོགས་དྲོ་ལྡན་རླུང་གསོག་ལ། གྲང་བས་ལྡང་ཞིང་སྣུམ་དྲོས་ཞི་བར་འགྱུར། (TII, Ch 9, pg 74). Tidwell translation.

142 རྒྱུ།

body.[143] I noticed how coffee particularly grounds downward-voiding *rlung*[144] from the pelvis down, but raises all-pervasive *rlung*[145] from the heart and chest up. I noticed green tea raises all-pervasive *rlung* and upward-moving *rlung*[146] but had little to no effect on downward-voiding *rlung*, which often resulted in headaches for me. Many of my mentors describe green tea as counter-indicated for patients with high blood pressure, and this experience clarified their insight for me. The characteristics of the *nyépas* are primary metaphors to build these conceptual and experiential layers. They become experienced in and through the body the more that they are explored.

Research on metaphor has shown how metaphors guide how we focus our mind and engage action, such as attention (Fernandez-Duque & Johnson 1999). Whether "filtering" one's attention, focusing like a "spotlight," increasing activation in specific brain regions, applying a pre-motor visual system, or applying limited resources in the brain, various metaphors used in research on attention shape the way attention is evaluated by the very metaphors they use to describe attention behaviors (ibid: 84). Fernandez-Duque and Johnson show that "a highly constrained set of conceptual metaphors is constitutive and definitive of the theoretical perspectives taken toward attention and toward the research programs based on these theories" (ibid: 84). The metaphors thereby provide the conceptual substance and logic of the theories. Thus,

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[143] In Tibetan medicine, as in Tibetan Buddhism, mind is understood to both permeate the body and coalesce in specific regions, such as the heart and gut. Training the mind and senses is also teleologically understood as training the body toward a form of diagnostic tool and understanding how to detect deviations from and invoke wellness in one's patients.

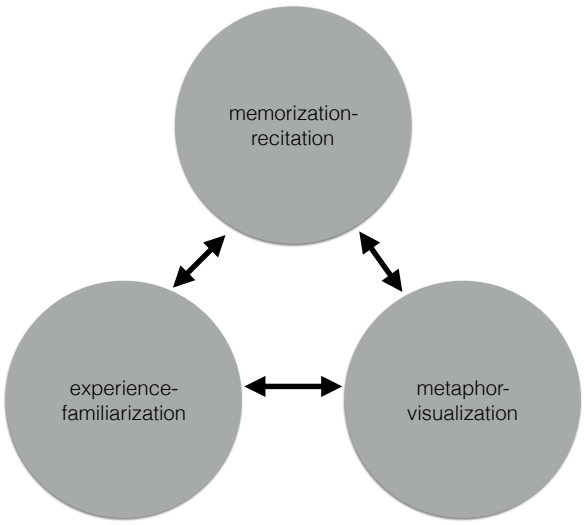
[144] ཐུར་སེལ་བྱེད།

[145] ཁྱབ་བྱེད་བྱེད།

[146] རྒྱས་རྒྱུ་བྱེད།

conceptualization and reasoning is structured by metaphor (ibid: 85).[147] The diagram below illustrates the interrelationships between memorization and recitation, metaphor and visualization, and clinical experience that we have discussed.

Figure 1. Interaction of pedagogical processes in Tibetan medical education



Grounded cognition and simulation

Grounded cognition, or "embodied cognition," provides an additional framework to understand the interplay of memorization, recitation and metaphor (Barsalou 2008:619). It is an area of cognitive science that focuses on the body in cognition, the bodily states that cause cognitive states and vice versa, largely arguing that these two relationships are inextricably linked. It views cognition as embodied when it is deeply dependent upon features of the physical body of an agent such that that aspects of the

[147] Fernandez-Duque & Johnson cite the following scholars contributing to this area of research: Gibbs 1994; Kovecses 1990; Lakoff 1987; Lakoff & Johnson 1980, 1999; Sweetser 1990; Turner 1991; Winter 1989, 1999.

body play a significant causal or physically constitutive role in cognitive processing (Wilson & Foglia 2017).

Grounded cognition has increased greater understanding of the role of simulation in cognition and how it integrates perceptual and conceptual modes coherently for "the reenactment of perceptual, motor and introspective states acquired during experience with the world, body, and mind" (Barsalou 2008:618). Grounded cognition describes how various experiences encode states into a multimodal representation stored in memory. For example, Barsalou gives the example of the act of "easing into a chair," drawing upon experiences and understanding of how the chair looks and feels, the action of sitting, introspective experiences of comfort and relaxation, tactile experiences of the chair itself, the feeling of one's weight and body movement in resting into a chair. When these experiences are drawn upon to simulate the experience in one's mind, these multimodal representations are reactivated in the same regions of brain that are associated with the actual perception, action and introspection involved in the action and experience[148] (Barsalou 2008:618-9). Accounts of grounded cognition that look at situated action, social interaction and the environment[149] demonstrate that cognition evolved to support action in specific contexts and situations by processing and encoding interactions between perception, action, the body, the environment, and other agents (Barsalou 2008).

When we imagine seeing a scene, our visual cortex is active. When we imagine moving our bodies, our pre-motor and motor cortices are active. Imaging studies have

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[148] We can see this process most clearly in the work done on mental imagery (Kosslyn 1980, 1994, 2000, 2006).

[149] E.g., Barsalou 2003, Barsalou et al. 2007a, Glenberg 1997, W. Prinz 1997, Rizzolatti & Craighero 2004, Robbins & Aydede 2007, E. Smith & Semin 2004, Yeh & Barsalou 2006.

shown that even when processing artifacts, motor regions become active; when processing foods, gustatory regions are active; and when processing things that smell, olfactory regions become active (Barsalou 2008:627). At the turn of the century, Konstantin Stanislavski developed a technique called Method acting meant to help actors more "realistically depict their character" with emotional and physical cues (Foer 2012:133). A phrase is more likely to stick in one's memory if one acts it out. Thus, simulation and memory are tightly connected.

Mirror neurons are a unique class of neurons that have been observed directly in primate species, particularly in the lateral ventral premotor cortex and Brodmann area 44 (Gallese & Goldman 1998; Kandel 2000: 778; Zatorre 2007:551). These neurons discharge when an actual movement is performed but also when an observation of someone else making that movement is performed. They are thought to be implicated in imitation learning and theory of mind (Gallese & Goldman 1998; Tomasello et al. 1993; Byrne & Russon 1998). Byrne and Russon (1998) particularly describe such activation as "priming" or emulation. In humans, brain activity consistent with that of mirror neurons has been found in various areas of the frontal and parietal brain regions, specifically, the premotor cortex, supplementary motor area, primary somatosensory cortex and inferior parietal cortex (Molenberghs et al 2009).

Mirror neuron circuits assist in simulation, allowing us to imitate others' actions and mental states for diverse purposes — both in observation as well as mental simulation. Mirror neurons help us simulate others' mental states thought to be important in developing empathy as well as the movements necessary to develop language skills. In

short, many of the same parts of our brains are active in imagining, or simulating, as in perceiving and doing. A simulation or an enactment[150], real or imaginative, is dynamic; that is, it occurs in real time.

Our sensory-motor concepts arise from our sensory-motor experiences—moving in space, perceiving, manipulating objects and so on. Fixed concepts are neural information structures, or parameterizations, that can guide imaginative enactments when activated. Conceptual metaphors, at the neural level, link these source-domain parameterizations. We carry out metaphorical enactments, or forms of simulation and imagination, whereby sensory-motor enactments unfold in real time and in real contexts, facilitating and governing abstract reasoning (Lakoff & Johnson 2008: 257-8).

Furthermore, imaging studies have shown that when reading text that depicts scenes, spatially encoded regions of our brain become activated and that readers often confuse pictures with text meaning that readers are simulating textual meaning (Barsalou 2008:627). When comprehending a text, people "construct simulations to represent its perceptual, motor and affective content" such that "simulations appear central to the representation of meaning" (Barsalou 2008:633).

Although little research has examined memorization of large volumes of text or the interaction between metaphor and sensory-motor cortices, let alone the relationship between the two, a study investigating memory and embodied cognition found that participants remember more of a story if they physically acted out the narrative[151] (Scott

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[150] Lakoff and Johnson (2008) use the term enactment for dynamic brain functions shared both during perceiving and acting and during imagining (257).

[151] A limitation to this study is that all ninety-one participants were of a single gender, female.

et al 2017). As Barsalou (1999a) has argued, “the primary function of cognition is not to archive information but instead to prepare agents for situated action” (61). Thus understanding is motivated toward a “set of actions available to a given individual in a given situation” (Glenberg & Robertson 1999:21). Since cognitive processes have coevolved with other biological systems of the body, they are integrally related and motivated toward the biological body with all of its needs, motivations and impulses for survival and action situated in the ecological world. Thus, much of the neuroscience research on memory has focused on the archiving and encoding of information instead of the enactment of it for action. The relationship between understanding, memory and employing for action has been little understood. Likewise, the role that engaging with external objects, bodily process and the environment plays in comprehension and cognition has been little examined.

One of the areas that may have greatest overlap with the process of memorization, metaphorical thinking, and narrative and enactment in real time is performance: theater, dance, singing and musical theater. Actors must memorize lines from a script, visualize the setting and interactions and enact that world. Actors develop characters through repeated rehearsal, developing characters with specific motivations and personalities in their minds. H. Noice (1992) and T. and H. Noice (1997a, 1998) looked at the “cognitive-emotive-motoric” process that gets repeated for actors to engage in active experiencing to retain memory of their lines and engage with the personality, intentions, motivations, inner thoughts and experiences of a character. They call this “active experiencing;” (ibid) and this literature describes how techniques useful to actors may be more widely

applicable to learning generally (Scott et al 2001). Facial expressions, body language, tone of voice and gestures would mediate a layering of affect, motivation and intention that the actors had developed through repeated rehearsal and reflection on the lines and character. Body movements, postures and gestures performed through space help to make the lines and characters come alive — in the minds and bodies of the actors as well as the experiences of the audience. Similarly, in memorizing the Tibetan text, one should walk and move around through space as one recites, using the physical environment and one's body as a way to reflect on the content of the text and contemplate its various layers. In many ways, the student is layering visualized contexts into the stanzas as they are recited, reflected upon and enacted in real time. In the clinical setting as well, one is "active experiencing" — seeing how the stanzas of the text come to life, seeing how the pathways of a *nyépa* as described in the text come alive in the experience of a given disorder or disease by a patient. It is truth-checking the text in some ways, and relating to the "active experiencing" one has gone through in one's recitations in others. How did certain metaphors feel in one's own body when one was visualizing the experience? Is this how they actually come about for the patient?

The ability of the student to engage in first-person experience and reflection of how the content of the medical text relates to him or her enhances the ability of that student to understand, engage and employ the content. Stanislavsky (1936/1984) looked at this self-identification process in the ability of actors to place themselves in the mind of the character they are performing. His work suggests that identifying elements of one's

own personality, emotions and experiences with that of the character facilitates one's engagement with that character and ability to enact that character masterfully.

Cognitive interviews (Fisher & Geiselman 1988; Geiselman 1988) have used similar techniques as described in grounded cognition and simulation accounts to help witnesses recall elaborate details from a crime scene. Since false memories of experiences can be easily facilitated (Hyman, Husband & Billings 1995; Loftus & Ketcham 1994; Loftus & Pickerel 1995), this imprinting process is critical.

Applications in memory, metaphor, grounded cognition & simulation: Encoding memory into space

Memory palaces, maṇḍalas and metaphorical loci

As discussed earlier, the evolutionary roots of memory facilitated a human capacity to map resources and objects necessary for one's survival onto a spatial landscape both remembered literally from the physical environment, but also as a landscape joined with narrative in one's mind to facilitate memory retention. This capacity developed into various techniques historically, some of which are still used for limited application in contemporary times, in which loci are used to impress "places" and "images" on memory, such as in the form of memory palaces in Europe, *maṇḍalas* in Buddhist and Hindu practices, and similar techniques among peoples and cultures throughout the world. This art of memory has been called "mnemotechnics." Among Euroamerican cultures, mnemotechnics originated in Greece before the literary word. Similarly, from at least the time of the Buddha spanning the sixth and fifth centuries

BCE, the Buddha requested his word be disseminated in the vernacular, and mnemotechnics were used exclusively since the *sūtras* were not committed to writing until at least four centuries after his death (Lopez 1995:39).

In the Greek tradition, the origin of mnemotechnics begins with the story of the Greek poet Simonides of Ceos. The story describes that he was called to a banquet in honor of Scopas, a Thessalian nobleman. After delivering an ode to Scopas, Simonides was requested to leave the banquet hall and receive a message from two young men on horseback. Just as he left the banquet hall, the entire roof of the building collapsed, leaving no survivors. The corpses pulled out of the wreckage were unrecognizable and family members of the victims requested Simonides to assist in identifying the bodies so they could conduct a proper burial.

Simonides realized that he easily recalled the detailed layout of the banquet hall before it collapsed (Foer 2012:94). He could also recall the location and appearance of all the guests distributed throughout the banquet hall. He proceeded to recreate the structure of the banquet hall in his mind, locating every guest among the various internal landmarks, re-creating pillars and arches, tables filled with food surrounded by their attended guests, each reaching for or enjoying a different delicacy and wearing elaborately ornamented costumes. Through this visualization, Simonides was able to assist the relatives in locating each of the loved ones they had searching for. From this legend, the art of memory, *ars memorativa*, in the European tradition was born (Foer 2012:1-2).

European history describes how such techniques of memory were used extensively thereafter. Cicero and Quintilian used mnemotechnics for refining and codifying extensive sets of rules and instruction manuals. In the Middle Ages it provided methods for memorizing sermons, prayers, and punishments for the undisciplined, even entire books as seen in the Tibetan and Indian traditions. Roman senators used the technique to memorize their speeches, and the Athenian statesman Themistocles to memorize the names of twenty thousand Athenians (Foer 2012:9-10). In these European traditions, memory training "was considered a form of character building, a way of developing the cardinal virtue of prudence and, by extension, ethics. Only through memorizing, […] could ideas be incorporated into one's psyche and their values absorbed […] to etch into the brain foundational texts and ideas" (Foer 2012:10).

The technique is described to have continued on to Rome and thereafter spread across Europe to create a widespread tradition (Yates 1966:xi). The first text in Europe to describe memory palaces and the art of memorization more broadly was *Rhetorica ad Herennium*[152], the oldest surviving Latin book on rhetoric, written between 86 and 82 BC (Foer 2012:94), of which only ten pages are dedicated to the discussion of memory. This technique has become known by various names such as the "memory palace," "method of loci," or "journey method." Similar to its origins with Simonides, the practitioner places objects to be remembered into a spatial setting, such as an ornate palace or familiar path across a landscape. Then one merely needs to use one's imagination to walk through the place to remember the various elements on the list.

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[152] Anonymous authorship.

The text makes a distinction between natural and artificial memory: “The natural memory is that memory which is embedded in our minds, born simultaneously with thought. The artificial memory is that memory which is strengthened by a kind of training and system of discipline” (Foer 2012:96). The text highlights this natural capacity to fuse spatial with semantic memory, and the “artificial” application in which one intentionally uses the technique for things to be memorized. Artificial memory is comprised of images and places, where images represent what one wants to remember and the places, or loci, are where the images are to be stored.

The text describes two types of recollection: *memoria rerum* and *memoria verborum* — memory for things and words, respectively (Foer 2012:122). Quintilian, a Roman rhetoric master and teacher, privileged *memoria rerum over memoria verborum* because the images required to install the later grossly exceeded the former and content was more efficient and stable. Thus, Cicero, in his *De Oratore* describes a similar concept of placing images for each topic, over installing images for the exact words (Foer 2012:123). Foer assesses, “In real life, it’s rare that anyone is asked to recall *ad verbum* outside of congressional depositions and the poetry event at an international memory competition” (2012:125). However, Foer neglected some of the contemporary examples of the greatest *literate* oral traditions throughout Asia.

In Europe, the development of the Gutenberg printing press in the fifteenth century meant that the need to memorize text and literally incorporate the words and content into one’s mind and behavior became less important. One could simply carry and make many copies of the physical texts. Today, those competing in various memory

championships see themselves as rescuing "a long-lost tradition of memory training that had disappeared centuries ago" (Foer 2012:10). One such contemporary memory champion, Ed Cooke, describes how these are skills that anyone can develop; they are basic capacities of the human mind. Since such applications of memory are rarely used in contemporary society, those who employ mnemotechnics are often seen as anomalies in brain function. However, they are simply skills that have atrophied due to lack of use.

"Elaborate encoding" is a technique that draws upon the kinds of memories our brains are good at retaining. Ed Cooke describes, "The general idea with most memory techniques is to change whatever boring thing is being inputted into your memory into something that is so colorful, so exciting and so different from anything you've seen before that you can't possibly forget it" (Foer 2012:91). Cooke describes two conditions particularly useful in crystallizing memory: jokes and sex. He says jokes about sex are even more resilient in retaining memories (Foer 2012:100). Peter of Ravena, author of one of the most famous memory textbooks of the fifteenth century, begs pardon from the prolifically pious and chaste of religious readers when he says, "A secret which has (through modesty) long remained silent about: if you wish to remember quickly, dispose the images of the most beautiful virgins into memory palaces; the memory is marvelously excited by images of women" (Foer 2012:100). The other key to solidifying memories through mnemotechnics is creating highly vivid images. Joshua Foer, a journalist who became a world memory champion with just one year of training describes the quality of good images—"the funnier, lewder, and more bizarre, the better" (Foer 2012:100). Foer notes, "When we see in everyday life things that are petty, ordinary, and banal, we

generally fail to remember them, because the mind is not being stirred by anything novel or marvelous. But if we see or hear something exceptionally base, dishonorable, extraordinary, great, unbelievable, or laughable, *that* we are likely to remember for a long time" (2012:100).

The Tibetan use of the *maṇḍala* is exactly such a visualized memory storehouse. It allows for the practitioner to map external qualities into internal characteristics for enlightened transformation. The more vivid, extravagant and grotesque or awe-inspiring, the better. Images of deities are tremendously elaborate with each detail carrying rich symbolism of qualities one is to cultivate, enumerated disciplines to keep in mind, and mind sets to emulate. The most exquisite of both male and female forms are used in deity form in Tibetan Buddhism. *Ad Herennium* also describes the use of animating objects for greater memorability — infusing them with life, lavishly ornamenting them, and so forth. Likewise, making them grotesque, disfigured, tainted or comical would also make them more memorable. In many ways, memory champion and cognitive scientist Ed Cooke describes how the art of memory is more the art of creativity (Foer 2012: 100)— assembling landscapes in which to embed images and conjuring images that are so vivid and extravagant that they cannot be cognitively separated from the places in which they were installed.

Founder of the World Memory Championship in 1991 and national championships all over the world during the last decade plus, Tony Buzan has worked to implement the memory techniques in schools globally as a "global education revolution

focusing on learning how to learn"[153] (Foer 2012:11). Buzan notes that Western education delivers vast amounts of information to students, but does not teach how to retain and integrate that information. Furthermore, rote memorization is characterized as mindless, instead of mindful. Buzan describes the need to engage the mind and make it enjoyable. He says memory training is a form of mental workout, making the brain "fitter, quicker and more nimble" (Foer 2012:12). He developed techniques called "mind mapping" and "radiant thinking" to develop learning techniques (see for instance, Buzan & Buzan 1996, among many others).

Buzan estimates that if an average person wants to make it into the top three of the US memory championship, he or she would need to spend an hour a day, six days a week. For the world championship, he estimates three to four hours a day for six months before the championship (Foer 2012:13). These latter numbers are similar to the time investments my classmates and I made for our textual memorization of the *Four Medical Transmissions*. However, the memory exercises of contestants are quite different than that of Four Medical Transmissions stanzas. Contestants had to memorize a list of hundreds of random words, a thousand random digits, a hundred photographic portrait head shots, and the order of a shuffled deck of cards (Foer 2012:8).

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[153] Similar initiatives have been proposed by memory champions Ed Cooke and Lukas Amsüss of Oxford University with a similar aim to "rehabilitate Western education" (Foer 2012:15).

By contrast, much of the applications of memory palaces throughout history focused on poetry.[154] The *Four Medical Transmissions* is already organized with poetic meter, narrative and metaphor to facilitate the memorization process. The brain best remembers things that are repeated, rhythmic, rhyming, structured, and above all, easily visualized (Foer 2012:128). The Four Medical Transmissions also makes extensive use of repetitive phrases. For example, every chapter, section and compendium starts with the phrase, "Then again the Sage Yidley Kye said to Rigpé Yeshe…." The most critical mnemonic trick used by bards is song. "Song is the ultimate structuring device for language" (Foer 2012:128). Homeric bards sang their epic oral poems, the Torah is marked with musical notations, the alphabet is taught in song, and so forth. Due to the highly personalized techniques used of visualization, song, poetry and so forth, many mnemonists claim that blocking out sensory stimuli is critical to the memorization process[155] (2012:119).

Classics scholar Milman Parry researched the last bards to use the form of oral poetry resembling that of the Homeric arts by going to Yugoslavia (Foer 2012:128-9). He describes the use of imagery, alliteration, and meter to fit words to the structure. When writing evolved in Greece, the flexibility of oral bards had to be unscripted onto an

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[154] Ed Cooke claims to have learned *Paradise Lost* by heart at the rate of two hundred lines per hour. In a parallel to many of the Tibetan doctors who recited the Four Medical Transmissions and other memorized commentaries while imprisoned during the Cultural Revolution in Tibet so as not to let their knowledge atrophy, Ed Cooke describes, "Given that an hour of memorization yields about ten solid minutes of spoken poetry, and those ten minutes have enough content to keep you busy for a full day, I figure you can squeeze at least a day's fun out of each hour of memorization—if you should ever happen to find yourself in solitary confinement" (Foer 2012:109). Though his account has a comparative optimism, memorizing one's Buddhist texts is a primary mode for etching the most critical visualizations and practices in Buddhism into one's mind so that while one is in retreat, or even more so, at the transition to the intermediary state of bardo, one can rely on one's memory to generate the proper visualization or mental state to attain enlightenment.

[155] For example, Gunther Karsten, Ben Pridmore, Tony Buzan, Joshua Foer.

unchanging surface — it "lived on the page" such that each word needed to be painstakingly selected, a single author expressing a singular vision that must incorporate the depth and breadth of meaning, must conjure up the appropriate imagery for the vast number of audiences it would encounter and must orate beautifully.

Memorization generating creativity

Furthermore, in contrast to contemporary conceptions of memory, Roman orators argued that the proper retention and ordering of knowledge vis-à-vis the art of memory critically facilitated the invention of new ideas. Thus, it drove creativity instead of extinguishing it.

Learning a text is imprinting it into one's heart, allowing for the depth of the text to penetrate one's mind as well as one's experiences, it is to fully absorb into the content of the text—to become intimate with it, to make it one's own. As Dutch poet Jan Luyken wrote, "One book, priced in the Heart's own wax / Is worth a thousand in the stacks" (Foer 2012:110). "I have thoroughly absorbed these writings, implanting them not only in my memory but in my marrow," said Petrarch in a letter to a friend (Foer 2012:110). Memorization is considered a "creative and humanizing endeavor" (Foer 2012:121). Similar to my experience in memorizing the *Four Medical Transmissions*, and in contrast to my early assumptions that memorization would dull and collapse innovation and creativity in thinking about the body and health, I found memorization to be significantly generative by building a foundation from which to layer the infinite possibilities of patient case studies and disease etiologies.

In contrast to Western conceptions that memorization creates automotons and robots, it was seen as the driver of developing one's character, and endeavor into humanizing one's self. Konner (1987) makes a plea for a similar humanizing pedagogy in Western medicine. He asserts the case for humanistic physicians who are clear communicators, attentive listeners, and exhibit compassion and empathic human connectivity—all simultaneously as tools for providing quality medical care. The input of large amounts of information into one's memory does not need to be separate from developing one's self as a human being. In fact, the pedagogical case in Tibetan medicine exemplifies it. It just needs to be the right crafting of the right information.

Synesthesia and memory capacity: re-defining the norm

Psychologist Aleksandr Luria wrote a famous account of studying a patient he refers to as "S." A journalist in Russia, S was asked by his boss to see Luria because he never wrote anything down in meetings and was seen to be dissident. In reality, he felt taking notes would interfere with his ability to remember everything in the meeting, which gave the impression to his boss that he was subversive. On the contrary, Luria found S's memory to be exceptional. Luria found that he had no method which could sufficiently measure the limits of S's memory because his memory appeared limitless. S's memories seemed to encode any material with which it was provided, whether he had exposure to that subject previously or not—memorizing complex mathematical formulas without knowing math, Italian poetry without speaking Italian, and even nonsensical phrases. Furthermore, S's memories did not seem to degrade. He had a strong sense of

synesthesia that seemed to fuse with memories in an experiential manner. For example, even when an examiner said something during an experiment, S noted a "blur would appear on the table and would spread and block off the numbers, so that S in his mind would be forced to 'shift' the table over, away from the blurred section that was covering it" (Luria & Bruhner 1987:384). He noted that the same thing happened if he heard noise in the auditorium — "puffs of steam" or "splashes: would appear making it more difficult for him to read the table (ibid).[156]

Cooke[157] describes how he remembers ninety-nine faces and names in the memory championships. He associates the name with an image that will "pop back into your mind" — a kind of manufactured synesthesia (Foer 2012:44). Psychologists have called this the "Baker/baker paradox" in which a researcher shows two participants the same photographs of a face and tells one that the surname of the person is Baker and the other that in addition to the surname being Baker, his profession is a baker. The person who was told the man's profession is much more likely to remember the surname than the one who was just given the surname. This result is due to the way a memory is embedded in numerous networks that encode a given piece of information. Knowing that the person is a baker conjures up more mental imagery—the smell of bread, the white baker's hat, the warm environment in which he works and so froth —than just knowing the surname.

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[156] Jorge Luis Borges's short story "Funes the Memorious" is about a fictional version of S showing that an infallible memory such as that of S cannot distinguish between trivial and important, cannot prioritize, generalize, or think of platonic ideas. He describes how what makes us human is the ability to forget: "To think," Borges writes, "is to forget" (Foer 2012:37).

[157] Cooke taught Josh Foer to be world memory champion in just one short year.

Synesthesia is classified as a rare "perceptual disorder" with which words fuse with mental imagery, colors, sounds, tastes, and other perceptual experiences. Early psychologists assumed that words conjuring imagery was a rare experience among individuals. However, with more research in grounded cognition, simulation, metaphor, and the synchronization of mental imagery and concepts, there is greater understanding that this is a common if not universally human phenomenon, in which, in today's modern world, some have a greater developed capacity or proclivity than others. Likewise, S's case shows the utility in employing visual synthesis of imagery to shift conceptual and physiological response. S described being able to abolish pain by actively engaging with the images. S described, "Let's say I'm going to the dentist…I sit there and when the pain starts I feel it…it's a tiny, orange-red thread. I'm upset because I know that if this keeps up the thread will widen until it turns into a dense mass….So I cut the thread, make it smaller and smaller, until it's just a tiny point. And the pain disappears" (Foer 2012:32). This may sound similar to many of the Tibetan and Indian Buddhist yogic techniques in controlling response to various bodily experiences such as pain, cold, heat and so forth. It is also an important framework for understanding how Tibetan medicine links physiologic disease experiences to mental and emotional patterns.

As an anthropologist, I delighted in my Tibetan medical student education experiences—observing my capacities of memorization unfold with the layers of imagery and clinical experience deepening the understandings prompted by the text. Exciting theories of the potential of humans to engage in this kind of knowledge procurement,

maintenance, and transmission frequently came to my mind during my memorization-recitation sessions.

Memorization and recitation in orally transmitted literate traditions

Some scholars have discussed the problem that the discourses spoken by Siddhartha Gautama were not written down during his lifetime as the Buddha. It is said that people had such robust memories that they could remember oral teachings verbatim for many years thereafter, and with greater integrity than if they were written down. I was skeptical. However, the more I memorized the text, the more I could see this as a possibility. Discrepancies in different versions of the *Four Medical Transmissions* that I had a chance to look at stuck out at me like a sore thumb. There were certain words and sections in the *Four Medical Transmissions* that our teachers noted were likely mistakes when they were block printed.

The *Mahāyāna sūtras* share many similar qualities of the *Nikāyas,* the earliest collection of discourses spoken by the Buddha, to qualify them as primarily oral — redundancy, stock phrases, and reliance on lists (Lopez 1995: 41)[158]. Buddha's teachings were passed down for four centuries by oral tradition until they were written down in Sri Lanka in the 1st century BC. These qualities of oral transmission, such as alliteration, repetition, assonance, metaphor, metrical composition of exact repeated syllable numbers, rules of long and short phrases, as well as short, medium and long versions of similar

[158] Lopez does acknowledge that the Mahāyāna sūtras differ from earlier works in that they express a certain degree of self -consciousness and "exaltation of their own status as texts, as physical objects, with many works being devoted almost entirely to descriptions of benefits to be gained by reciting, copying and worshipping them (Lopez 1995:41).

content, also certainly exist in the *Four Medical Transmissions*[159]. The similarities in composition and oral transmission techniques to early Indian texts may oppose Yang Ga's claim that the *Four Medical Transmissions* was largely composed by Yuthok Yonten Gonpo the Younger and his closest disciples. The structure demonstrates many qualities that would expose it as primarily an oral text before it was written down, and quite possibly originating in an earlier elder related to Yuthok, as in a figure unrecorded in history but whom oral tradition calls Yuthok Yonten Gonpo the Elder. It is also important to note that the first *Four Medical Transmissions* was written and copied by hand, and likely contained few separations, if any, between syllables. This meant that to engage with the text, one had to know it well, and that the purpose was to be able to recite it.

Chapter conclusion

The mechanics of memory formation, storage, consolidation and retrieval, as well as the enacted forms of cognition in metaphor, grounded cognition, and simulation are portals to understanding the function of memorization, recitation, visualization and clinical experience in Tibetan medical pedagogy to entraining the senses and producing Tibetan physician as embodied diagnostic tool.[160] Likewise, numerous historical and cross-cultural examples show that these education techniques have been a form of training embodied knowledge beyond the Tibetan medical context. Experiencing myself and observing classmates in thousands of hours of memorization and oral recitation of

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[159] For an explication of recitation techniques specific to the Vedas including the Principal Upanishads see Pierre-Sylvain Filliozat's work in *History of Science, History of Text* (Chemla 2006).

[160] In the experience of memorization, the activation and entrainment of my mind was simultaneously moving through my body and to others in its understanding of the text.

root canonical texts written in these poetic, metaphorical and trickster modalities, a mechanism emerges integrating layers of conceptual, perceptual and embodied entrainment of the physician for deploying Tibetan medical theory and practice. Such understandings are inexorably linked to experiential understandings of the natural world, and visualized *reenactments* of these relationships, as Lakoff, Johnson, Barsalou and many others have argued in their work on metaphor, grounded cognition, and simulation. Through the lens of textual recitation, clinical engagement, observing the macro and micro cycles of one's own body, the bodies of others, and the ecological and social web of relations such patterns are tracked, imprinted in the body, and clinically engaged. This forms the conceptual-perceptual dialectic central to Tibetan medical pedagogy in entraining diagnostic embodied skill, which I will elaborate more in the next chapter on *pramāṇa* theory.

Chapter V
Epistemological Grounds:
Pramāṇic bases for embodied knowledge in Tibetan medical diagnosis

Like a key to unlocking the mechanism of the training processes in our education, the epistemology and ontology that we learned in our Buddhist philosophy classes was a theoretical framework from our Tibetan medical tradition that provides a corollary to the cognitive neuroscience perspective on the pedagogical roles of memory, metaphor and visualization that I presented in the previous chapter. The specific presentation that we learned in our coursework in terms of Dharmakīrti's approach to *pramāṇa* theory provides the grounded theory of this work and stands as an interlocutor with the related research in contemporary cognitive neuroscience. Since the physician is an embodied diagnostic tool in Tibetan medicine, in order to establish valid evidence for differential diagnosis, one needs to know how to produce reliable data through direct perceptual means and the related inferences from which one acts to diagnose and treat. Although there is extensive scholarship on interpretations of Dharmakīrti's approach to *pramāṇa*, I focus on that which was presented in my medical classes at both institutions, framing it within the greater Indic tradition of *pramāṇa* generally, to demonstrate how it shapes a distinctive Tibetan medical ontology and epistemology—a theory of sensory training and cognitive change in embodied knowing—that I present in the subsequent pages.

I will first describe the texts and curricular content we used at Men-Tsee-Khang (MTK) and Sorig Loling (SLL) for learning Dharmakīrti's epistemology and ontology, then I will present the ontology of the body that stems from work on *pramāṇa.* Thereafter, I will describe the Buddhist model of cognition and epistemology, outlining

the basics of *pramāṇa* theory and how one might cultivate methods of valid cognition as an embodiment process for generating physician as diagnostic tool.

Laying epistemological grounds at Men-Tsee-Khang

The text from which we studied Buddhist theory and dialectical debate at Men-Tsee-Khang is the *Magical Key of Principles and Logic of the Collected Topics on Opening the Principal Meaning of Pramāṇa (Valid Cognition)*[161], written by Purchok Jampa Gyamtso (1825-1901). Purchok Jampa Gyamtso is an important Geluk lama and scholar who was one of the official preceptors of both the twelfth and thirteenth dalai lamas. He is best known for his expertise in Collected Topics[162], which is an introduction to basic themes in *pramāṇa* including genres like *lo-rik*[163]*,* typologies of epistemologies, or *tak-rik*[164], typologies of reasons. This text provides the curriculum for the basic course of study of elementary logic and dialectical studies in Tibetan Buddhism (TBRC 2017). In normal dialectic education, epistemological typologies[165] are presented by introductory textbooks. These are sometimes called *Mental States and Awareness*[166] (Dreyfus 1997:544 fn 30). In dialectic schools, such as the Dalai Lama's Institute of Buddhist Dialectics (IBD) up the hill from D'asa Men-Tsee-Khang, this kind of text is the

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[161] ཚད་མའི་གཞུང་དོན་འབྱེད་པའི་བསྡུས་གྲྭའི་རྣམ་བཞག་རིགས་ལམ་འཕྲུལ་གྱི་ལྡེ་མིག Hereafter referred to as *Magical Key of Logic* (*rigs lam 'phrul gyi lde mig*), the short form used by the tradition.

[162] བསྡུས་གྲྭ For further biographical information see TBRC's Treasure of Lives: http://treasuryoflives.org/biographies/view/Purchok-Jampa-Gyatso/3274

[163] བློ་རིག

[164] རྟགས་རིགས།

[165] བློ་རིགས།

[166] བློ་རིག

counterpart to a broader introduction to reasoning called *Typology of Reasons*[167]. These two types of texts, which form parts of the larger textbooks of Geluk monasteries, introduce the student to basic logical and epistemological concepts, which are later examined in greater detail while studying Dharmakīrti's texts themselves (Dreyfus 1997:544: fn 30). The selection of this text for teaching Buddhist logic for our classes reflects the distinct Geluk influence at Men-Tsee-Khang despite the larger Nyingma[168] and Kagyu historic influences on the development of Tibetan medicine (Garrett 2006:205).

At Sorig Loling, the text we used drew from Sakya, Nyingma and Kagyu scholars in teaching Buddhist logic.[169] The Sakya curriculum studies a *Typology of Reasons* written by Lo Khenchen (1456-1532), a major commentator of the thirteenth century polymath Sakya Paṇḍita (henceforth, referred to as Sa-paṇ) (1182-1251), one of the great masters and scholars of the Sakya lineage, but does not conduct a special study of *Typology of Mental States* since they are examined in Sa-paṇ's *Treasure of Logic on Valid*

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[167] རྟགས་རིགས།

[168] Early Tibetan medical works refer to the critical role of the nine *yānas*, an explicitly Nyingma practice (Garrett 2006).

[169] Dreyfus notes, "Geluk and Sakya thinkers are separated in their understandings of the notion of aspect and their theories of perception. Sakya thinkers are representationalists, whereas Gelukpas hold a form of direct realism, as they do not think that the direct object of perception, the objective aspect, is an internal representation" (Dreyfus 1997:406). Therefore, at MTK the epistemology has a slightly different presentation—that of direct realism in which objects have objective aspects that we as physicians are picking up in the perceptual data of our patients. At SLL, the epistemology is more representationalist akin to that of Dharmakīrti and propounded by Sakya Paṇḍita in which the aspects are actually internal representations. Regardless, this subtlety in training the senses need not create a distinction in practice: the aspects that physicians train in perceiving, whether objective aspects or internal representations, have a direct correlate with the external object and can be validated as having causal efficacy and provide indications for balance or imbalance of the patient relative to the myriad causes and conditions that interrelate to produce such perceptual content.

Cognition[170] itself, one of Sa-paṇ's greatest works, which is thoroughly studied in Sakya monastic education (*ibid*). I will elaborate on the SLL text in the next section.

At Men-Tsee-Khang, very few of us students had background in the study of *lo-rik* and *tak-rik*. However, since this pedagogy provides a foundation for Buddhist education, it is also assumed to be the context in which we understand the topics of ontology and epistemology generally, and how those apply to the medical subject matter particularly. Although Buddhist logic was not part of the formal education when Dharamsala Men-Tsee-Khang was founded in 1961, historically, medical students in Tibet would have had a strong foundation in such studies because all medical students were almost exclusively monks. In the last ten years, since the Fourteenth Dalai Lama has more actively advocated the importance of dialectical studies in Tibetan education generally, schools in exile, from primary and secondary schools to the College of Higher Tibetan Studies and educational bodies across exile, have integrated it into their curriculum.

Since Men-Tsee-Khang holds His Holiness the Dalai Lama's name, and since the Dalai Lama is one of the head lamas of the Geluk lineage, MTK also conceives of itself as primarily a Geluk institution. As such, alliances with the three main monasteries—Drepung, Sera and Ganden—are important, and monks from those institutions have historically formally entered studies at Men-Tsee-Khang. Our Buddhist logic teacher Geshe Tenpa Tashi studied at Drepung Loseling and was brought to Men-Tsee-Khang by Tenpa Choepel, the principal of MTK College, to teach Buddhist dialectics and debate to

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[170] ཚད་མ་རིགས་པའི་གཏེར།

the medical students. He is not a doctor, nor did he undergo any formal Tibetan medical studies even in the monastery.

Geshe Tenpa Tashi began each class describing the rationale for studying Buddhist logic and dialectics, citing its importance in our theoretical and practical development as Tibetan doctors. Geshe Tenpa Tashi tried to make connections to aspects of our medical curriculum as frequently as possible to motivate interest in the subject matter.[171]

Admittedly the rationale for studying Buddhist logic and its application to our medical studies was not readily apparent to me. I was motivated by a personal interest in the topic from my previous studies of physics and neuroscience. Likewise, I assumed various areas of Buddhist studies would better explain the mechanics of generating a genuinely well-functioning mind than would the medical studies. However, I also assumed that my medical studies would better explain the health implications of a well-functioning mind and that I would need little supplementation from Buddhist studies for integrating the relevant content. It only became clear to me when I reached Amdo that this area of Buddhist studies was integral to our Tibetan medical studies.

At MTK, although we were not expected to be as well-versed in Buddhist logic topics as, for example, a monk in the dialectical schools, Buddhist logic classes were part

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[171] As dialogues between Buddhist practitioners and scientists have developed under the guidance and leadership of His Holiness the Dalai Lama, many students have developed greater interest in studying Buddhist logic. Adams, Schrempf and Craig's *Between Science and Religion* (2010) provide context for the greater influences of an interest on science in the practice of Tibetan medicine inside Tibet. Astrology received the opposite influence in that it was considered the non-science part of the medical field. This was compounded by one of the Dalai Lama's comments that he did not believe in Tibetan astrology, and it had historically been used for making money by its practitioners instead of rendering beneficial services for the public. This is still the view of many Tibetan doctors with whom I spoke who graduated in the early 1990s, despite the central role astrology plays in diagnostics and some illness etiologies.

of our required curriculum in weekly class and evening debate sessions. It was also assumed we would get training outside of these classes, whether by traveling to various monasteries throughout India or studying at the nearby Institute of Buddhist Dialectics.

The written structure of *Magical Key of Logic* was formidable—a 3/4-inch thick book written in classical style with long lines of prose running continuously across the page as if published on the long narrow looseleaf of traditional block-printed texts held together by wood planks. Our text had a general table of contents in the front pages, but otherwise few section headers and little content formatting. The prose had extensive question-and-answer sections with little contextualization of the categories to which we were being introduced. Most of us found it difficult to understand.

One of my classmates, a nun at the time, suggested another textbook she had used in her studies down the road at the College of Higher Tibetan Studies. The text, *Principles of Logic,* is written by the college principal Geshe Jamphel Drakpa. This text laid out the principles in what I found to be a more accessible and organized style, tailored to a student population not entering the larger dialectical schools or aiming to become *geshes*, but needing a working knowledge of the material. The mandate by the Dalai Lama to integrate debate into the curriculum throughout the Tibetan school system made such a textbook a critical component of curricular publications for any school in Tibetan exile. Appropriately, since most of the students at the College of Higher Tibetan Studies are not expected to invest extensive hours in memorization and recitation, Jamphel Drakpa's text presents content in this more modern format: sections, headers, charts, diagrams, a table of contents and so forth. Thus, students can get a feel for the

outline of the text, topics, and divisions without having to memorize the text with its long lists of categories meant for mental assemblage of the textual structure and content.

Similar to early texts in Greece as discussed earlier in this work, until recently, texts in Tibetan society were expected to be engaged through the rigorous approach of memorization, recitation, and time-intensive familiarization of the content, such that the running prose style would not have felt overwhelming. As such, the organization of texts in visually-delineated categories and content was not as important when one would provide structural categories in one's mind through the memorization and familiarization process. When one does not need to memorize content, the visual aesthetics of content and categories play a greater role in comprehension and retention of content. Thus, our Tibetan medical education represented a hybrid between tradition and modernity, demonstrated by the type of texts with which we engaged and the methods of engagement.

With our Tibetan medical texts, particularly the *Four Medical Transmissions*, we approached them traditionally. Through extensive hours of memorization and recitation of the *Four Medical Transmissions*, we provided the content structure through becoming familiar with the categories mentioned in prose outline in the text. We wrote in section headers using colored pens so that the sections would be more obvious for us as we memorized. However, those section headings became less relevant the more time we spent with the text and the more fluid the recitation became. Additionally, we used another visual representation that was traditional: the allegorical trees that illustrate the

content on paintings through roots, trunks, branches, minor limbs and leaves of all possible categories of illness, diagnostics, treatment, and subject enumeration.

For the content that we were expected to know but not memorize, the texts most useful were those presented with visual representation of the categories and content. This provided easy access and retention. However, it was understood that the content itself would not necessarily permeate into the deeper layers of our mind, awareness, and senses. For example, without the embodied performance of the textual content in debate, it would remain more theoretical than implemented across illustrative examples and perceptual experiences. For debate, memorizing responses is useful to enact them on the debate ground, strategically delivering them one-by-one as one might do similarly in a game of chess. The physical performance of the debate gestures in dynamic interplay with one's debate partner enlivens the content with examples and integrates them deeper into one's awareness and understanding.

In this chapter, I look at the similar dynamics of embodied knowledge cultivation as I did in the last chapter from the cognitive neuroscience perspective but here from the Buddhist philosophical perspective. Similar processes mobilize content from memorization and recitation into embodied layers of cognition. The sounds encode into muscle memory. The metaphors get evoked in innumerable visualized contexts. And the stanzas deepen in meaning and insight as they permeate the particulars of a practical context and as the physician reflects on their meaning from specific case studies in clinical context. Here I am particularly interested in the dialectic of perceptual particulars

of a practical context that merge with the conceptual patterning of medical meaning that guide action.

Debate Class at Men-Tsee-Khang

Geshe Tenpa Tashi began our weekly debate class by reading a section from *Magical Key of Logic.* He often used examples from science, or more aptly, examples he had heard the Dalai Lama discussing regarding recent scientific studies that applied to the topic. Then our class was released to implement the content from the text into a more classical debate style in the evening session.

Debate is often described as the "Tibetan national sport" — perhaps somewhat in jest, but in practical experience as well. It is dynamic, competitive and highly physical. The responder sits cross-legged on the ground as the questioner stands in front of the responder to launch logic propositions. With great bravado, the questioner launches from a raised high position standing straight on the right leg with right hand raised over head almost as in flight, and the left foot raised with knee bent. From this position, the questioners swings the right hand circularly around toward the left down to clap the outstretched left hand and stamps the left foot simultaneously[172]. The clapped hand resounds near the face of the responder with the question, or logic proposition, launched. The responder responds to each proposition, affirming the logic of the delivered statement; that is, the logical relationship between the proposition and consequence or lack thereof[173]. The questioner tries to intimidate the responder with loud questions,

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[172] See Dreyfus 2003:222-225 for extensive account.

[173] In technical terms, the pervasion of predicate to object, or lack of pervasion.

provocative movements and speed of sequentially hurled questions. The responder tries to remain calm and concise in responses.

At times, especially during dialectical examinations, there are many standing-stomping-clapping questioners hurling propositions at the responder. I watched the debate ground in front of the Dalai Lama's residence many times. The large courtyard, protected by a canopy of extended white stretched tent material, hosted dozens of pairs of debaters daily, where arms and legs flew in question-and-response. Some pairs were heated and antagonistic, and others had wild fun hurling their assaults of mental gymnastics and exaggerated physical motions.

In our MTK class, except for a quick fifteen minute introduction to the physical motions of debate, we never learned the protocol for this highly ritualized embodied intellectual activity[174]. Luckily, one of our monastic classmates from Amdo had gone through the traditional dialectic education and was quite familiar with the dynamics, technicalities, and process of debate.[175] He became a tutor and invaluable resource for all of us as we struggled to go through the motions and structured call and response on these logic topics. Thabké taught us the formal question and response dyads; arm, hand and leg movements; critical debate points and so forth. We would have been lost without Thabké to help us navigate the content and structure of debate.

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[174] This may have been due to the extensive instruction given in the monastic curriculum on this topic and uncertainty as to how to condense it for our purposes.

[175] Thabké, came directly from the shedra (བཤད་གྲྭ), the philosophical college in which texts from the Buddhist canon are studied and debated, in Labrang, one of the top dialectical schools in Amdo (Drotsang Dhondup 2013). Although very few of us understood much of what Thabké said at the time because of his this Amdo dialect accent from his fresh arrival into exile, his persistence and our eagerness to get something out of the debate sessions proved a fruitful combination.

Geshe Tenpa Tashi frequently said, “As you’ve seen before…,” reading several passages with little explanation, assuming we had already had an extensive formal introduction to the curriculum. I found there was a substantial base of Buddhist knowledge assumed at both MTK and SLL, but particularly at MTK. We were continually expected to find the means to learn the material with the assumption that we understood the critical relevance it played in the medical field.

My classmate Tashi Choezom at Men-Tsee-Khang had a cousin-brother who was a monk at IBD and tutored her on weekends, giving her texts and debate structure tutorials to teach her the concepts we were learning in class. He often encouraged her to come and participate in the well-known[176] and publicly-spectated evening debates at IBD so as to familiarize herself with the dialectical learning method, and, as such, practically learn the content. Such an opportunity was coveted by students, but often not used since our medical studies voraciously consumed our time. It was assumed that debating would sharpen our mental faculties so as to understand the nature of reality, the conceptual categories we worked with, and the levels of reality in which all these conceptual constructs and understandings operated. Many of my classmates from Men-Tsee-Khang traveled to south India during winter holidays for similar training opportunities as well. Men-Tsee-Khang sponsored many week-long trainings in Buddhist philosophy and logic for the students there.

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[176] See, for instance, Perdue 1992; Dreyfus 2003; Lempert 2012.

The initial topics studied in our Buddhist logic class, and standardly introduced in initial dialectic school courses, focused on perception: color and form. An example of an initial debate interchange would proceed as described below.

"The definition of a color is something that suitably appears to the eyes!" the questioner shouted with a stomp-clap, curling the upper clapped hand around the lower hand to symbolize the revolving wheel of *samsara* and pulling his *mala* up his arm to symbolize pulling sentient beings out of the cyclic existence into enlightenment and going beyond.

"*Död*," the responder said in affirmation.

"If the definition of a color is something that appears to the eyes, then the sky is a color!" launched the questioner at the responder.

"*Khyab pa ma chüng [The predicate does not pervade the conclusion!]*," said the responder, giving the characteristic response for when the logic statement proposition does not relate to the logical consequence.

"*O-ya*, then if the sky is not a color than it cannot appear to the eye," said the questioner.

"*Khyab pa ma chüng*," said the responder, again noting the predicate does not pervade the conclusion.

This question and response, or logic statement and evaluation, continued until the questioner caused the responder to self contradict, when he would yell, "*Khor süm*!" meaning "Three circles around your head!" or "*Tsa*!" meaning "The root thesis is finished!" and the questioner won the logic exercise. I observed these debates for years at

Sarah College, up at the Institute of Buddhist Dialectics, and at many monasteries, where the mainstay of Buddhist dialectical education was logic debate daily out on the debate ground. I loved watching the dynamic interplay between questioner and responder; it seemed mental acrobats complemented physical athletic dynamism. Though there appeared to be a winner and loser, Ani Kelsang Wangmo taught us in our semester course on Buddhism years earlier that the pairs worked together to dispel ignorance, sharpen the mind, and build understanding of logic and the nature of reality. The sound of the simultaneous stomp and clap symbolizes the sword of the Buddha of Wisdom *Mañjuśrī* cutting through ignorance to reveal the nature of reality. Our debates felt like child's play compared to those we could see up the hill at IBD.

I had a sense that proper training in Buddhist logic, where we would intensively study the texts, memorize lucid examples, and enact them through rapid pace, highly active, and theatrical debates, would inculcate our bodies and mind into a way of perceiving and engaging with the world that more closely aligned with reality. I also had a general sense that this would be important to becoming a skilled Tibetan medical physician, but I was not clear on the particulars of how and why. Likewise, since our contemporary context of Tibetan medical education meant that we had not received this training before beginning our medical studies, as was done historically, properly learning Buddhist logic would be a pursuit we would continue long after graduation.

Laying epistemological grounds at Sorig Loling

The text we used for the Buddhist Logic and Dialectics class at Sorig Loling (SLL), the Tibetan medical college in Xining, was called *Principles of the Aggregates, Constituents and Sensory Bases*[177]. It was written by Tamdrin Gyal, a revered senior physician and lecturer at the college. The text was part of the larger series of texts we used in Tibet: a ten-volume set taught over the first two years, and a fifteen-volume set taught over the last two years[178], integrating critical points from key commentaries on the *Four Medical Transmissions*.[179] When the Tibetan medical textbook series was initiated — for which Troru Tsenam Rinpoche, considered the greatest authority on Tibetan medicine in recent history, was the chief editor — Tamdrin Gyal was recruited to develop the Buddhist logic text in the series along with the text on hot illnesses. This textbook series was meant to provide a standardized Tibetan medical text basis and curriculum for all Tibetan medical schools throughout Tibetan regions—in the Tibetan Autonomous Region, as well as in the provinces of Qinghai, Gansu, Sichuan and Yunnan.

Often Tibetans residing outside Tibet, in exile, assume that those residing in Tibet will not have a good Buddhist education or rigor in theoretical training and practical experience in Buddhism. This assumption is understandable given the history of suppression and devastation throughout Tibet, particularly of Buddhist institutions and

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[177] རྣམ་བཞག་ཕུང་ཁམས་སྐྱེ་མཆེད།

[178] Sorig Loling covers the coursework in four years; whereas Men-Tsee-Khang takes five years for coursework. Both proceed into a year-long internship after coursework.

[179] Men Tsee Khang had a two-volume textbook that we used occasionally, but it often did not include key points from the commentaries. As students we most often consulted the commentaries directly, as we were encouraged to do so by most of our teachers, having to identify points of tension or synergy across commentaries. This was a time intensive process and I found that we mostly relied on three commentaries: *Blue Beryl*, *Teachings from the Sages*, *Teachings from the Ancestors*.

scholars. However, Tamdrin Gyal provides an exemplary contrast to this widely held notion by those outside of Tibet as an iconic figure in the resurgence of Buddhist education and training, particularly within the Tibetan medical field in Tibet.

The structure and content of the text that Tamdrin Gyal developed for our course at SLL[180], similar to that of Geshe Jamphel Drakpa's text at the College of Higher Tibetan Studies in India, demonstrated an approach for modern learners, integrating a table of contents, section headers, diagrams, and chapter summaries, and yet retained the classical education approach by extensively referencing the root and commentarial texts, including a section that students must memorize. This design is identical to the other textbooks in the textbook series. The series serves as an important supplement to normal memorization, recitation and study of the *Four Medical Transmissions*, as well as the original commentaries themselves. They extract important points of clarification and distinction from across the commentaries, as well as make explicit links with other sections of the text. The series also integrates clarifying diagrams, study questions, and re-printed images from the medical *thangkas* and allegorical trees, images students often do not see since the *thangkas* are usually displayed in museums and administrative offices[181].

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[180] I was told that schools in Lhasa or anywhere within the TAR were not allowed to use this text nor provide a class on Buddhist logic and dialectics; but as a standard part of the textbook series, it was hard for me to believe that they did not at least informally hold such classes and teach the content.

[181] This has changed in Amdo where more and more of the medical *thangkas* are being reprinted and hung in classrooms for student use. Likewise, Dr. Tashi Dhondup developed a manual to the medical *thangkas* that is affordable to students so they can become more acquainted with these valuable learning resources. I assisted him with the English translation of this trilingual text (Dhondup 2014).

Tamdrin Gyal goes further with his text than most other editors in the textbook series in that he provides a lengthy introduction recounting the historical foundations for *Principles of the Aggregates, Constituents and Sensory Bases*[182] as well as engendering conviction among its medical student audience of the integral role of Buddhist theory, *Abhidharma*[183], and *pramāṇa* in shaping the theoretical apparatus within Tibetan medicine, historically and currently. He also reminds the student reader and, reflexively, the tradition at large, that the study of *Sowa Rigpa*, the Tibtan term for Tibetan medicine meaning the "Knowledge of Healing," is an important field to master in the larger ambition of attaining enlightenment. This places Sowa Rigpa as a field of interest for all monastics and Buddhist practitioners as well, and places Buddhism and the ten great knowledge fields at the attention of every medical student. Interestingly, this argument was articulated in the very early days of Sowa Rigpa history in the thirteenth century when Sa-paṇ (1182-1251) on the Buddhist side, and in the twelfth century when Yuthog Yonten Gonpo (1126-1202) and his disciples on the Sowa Rigpa side (Garrett 2006:214), were formulating these fields as a coherent whole in the pursuit of enlightenment[184], whereas realization was viewed as the natural apex of scholastic achievement.

The dual ambition in Sowa Rigpa of helping others and gaining realization for the ultimate aim of enlightenment was reflected in the survey and interview responses of my

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[182] རྣམ་བཞག་ཕུང་ཁམས་སྐྱེ་མཆེད།

[183] *Abhidharma* (Skt. "higher teachings") is a collection of Buddhists texts (from 3rd century BCE and later) that contain re-workings of material in the early Buddhist sutras to provide a systematic presentation and classification of epistemology, ontology and metaphysics. It can be conventionally thought of as an integration of Buddhist philosophy, psychology, and ethics. Vasubandhu's *Abhidharmakosha* (*Treasury of Higher Knowledge*) is the main text studied in Tibetan monastic settings.

[184] Tibetan historian scholar Samten Karmay has observed that Sogdogpa Lodro Gyaltsen believed that Yuthog was a contemporary of Drakpa Gyaltsen, a great master of the Sakyas (Karmay 2005b; Yang Ga 2014:173).

classmates and mentors when asked why they chose this field of study and practice. While most respondents focused on both aims, some also highlighted one or the other. I was surprised by respondents who only identified "to study and practice Buddhism"[185] as their reason for studying Sowa Rigpa because it highlighted an underlying teleological context for many pursuing the path, and demonstrated the assertions of Sa-paṇ and, more recently, Tamdrin Gyal that it is part of a greater context of scholastic achievement and spiritual accomplishment.

Sa-paṇ himself was a serious student, teacher and practitioner of medicine (Garrett 2014:187). He relied on the works from Drigung medical writers and established a medical college in his region. Similar to Yuthog Yonten Gonpo's biography, Sa-paṇ's *Autobiography and Diaries* reveals how medical and religious scholarship and practice were combined in the lives of individuals, the great physicians of history (Garrett 2014:189). Sa-paṇ's life particularly demonstrated his dedication to both logic and medicine, perhaps formalizing these epistemological and ontological works as an integrated curriculum in Tibetan medical history[186]. Later, even in his fourteenth century history, Drangti Palden Tsoje contextualizes medicine within the five fields of knowledge noting similarities with the time of Yuthog (Garrett 2014:189).

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[185] The survey question is: ཁྱེད་ཀྱི་བོད་ཀྱི་གསོ་བ་རིག་པར་བསླབས་པའི་ཀུན་སློང་གཙོ་བོ་ཅི་ཡིན་ནམ། with the response "for Buddhist study and practice" reading: ནང་ཆོས་ཀྱི་སློབ་སྦྱོང་དང་ཉམས་ལེན་ཆེད་ཡིན།.

[186] Garrett (2014) notes that Sa-paṇ began with little formal education until he became an adult, focusing on ritual healing technologies before engaging in formal study of the Four Medical Transmissions (189). He began treating patients and giving initiations in Medicine Buddha and Yuthog Nyingthik during his thirties. He also integrated studies in Chinese medicine, begun after his thirties and continued throughout his life. He integrated studies in techniques from Nepal and elsewhere, and by his fifties, he was wholly engaged in medical practice, study, and scholarship, including herb-collecting trips where he documented his findings, and performed daily consultations with specialists on healing remedies, such as those for smallpox, sexually transmittted diseases (རེག་དྲུག), illness-causing *nagas* and various offering rituals for healing purpose (Garrett 2014:189; Garrett *forthcoming*).

Tamdrin Gyal describes logic as the "field of causes"[187] and the "field of reasoning"[188], or dialectics (2006:9). He describes how knowledge of *pramāṇa* provides the means for achieving the highest rank, enlightenment, quoting from the late fifth to mid-sixth century Indian Buddhist philosopher Dignāga's *Pramāṇasamucaya* (2006:10). Tamdrin Gyal describes how the great physician scholar Pandita Deumar Tenzin Phuntsok asserted that in order to become a physician with all the appropriate characteristics, one must study all five great fields of knowledge (Tamdrin Gyal 2006:12). He says without knowing the field of language, one will not gain a clear understanding; without being skilled in dialectics, one will not be able to refute those with wrong view; without skills in artisanry, one will not be able to able to heal body, mind and speech of one's patients; and without knowledge and practice of inner science, that is, Buddhism, one will not be able to eliminate the root causes of suffering (ibid: 12).

Also, in the field of Buddhism, one must be able to perform various practices and rituals: *mendrub*[189], medicine consecration[190], accomplish the signs of pulse and urine, rituals to satisfy one's principal practice *yidam* deity, receive blessings from protectors, dispel obstacles, and so forth—many activities in which one must gain mastery (Tamdrin

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[187] རྒྱུ་ཡི་རིག་པ།

[188] རྟོག་གེ་རིག་པ།

[189] སྨན་བསྒྲུབ།

[190] སྨན་ཕྱི་རབ་གནས།

Gyal 2006:13)[191]. Pandita Deumar Tenzin Phuntsok makes the case that there is no way to harvest and compound medicine properly without strong knowledge of the *Kālacakra Tantra* (Tamdrin Gyal 2006:13). He also describes how one must have a thorough knowledge of *Nak-tsi*, or Chinese Astrology, in order to correctly determine if a person will live or die, the proper timing to perform specific treatments, as well as timing and directions for specific compounding practices (Tamdrin Gyal 2006:13).

Tamdrin Gyal makes the case that the aggregates, psychophysical bases, sense sources and links of dependent origination form the base of all knowledge in Tibetan scholasticism[192]. He asserts that Ju Mipham's text *Summary Text on the Four Gates to Seeing the Truth* aptly provides a concise and pithy summary (2006:14). He explains his reasoning for the importance of this topic through a quote from Ju Mipham:

> All phenomena are conditioned including the five aggregates because they are assembled. As such, they are the basis of our discussion [on epistemology], along with causes, the world, perspective, abiding, and existence. If all objects to be known are assembled, then there are defiled and undefiled forms. Thus, one should know all the enumerations. Between the eye faculty and form exists mind and phenomena, it is called "producing-dispersing." The seven realms of

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[191] Our Tibetan medical education differentially integrates these rituals into our training. We conducted monthly ritual feast offerings, called tsok, in the tradition of Yuthok Nyingthik. These offerings are made to Yuthok Yonten Gonpo, an emanation of the Medicine Buddha and a *yidam* himself along with his entire maṇḍala retinue of deities, protectors, and activity goddesses. In our second year, we had the opportunity to participate in a mendrub with Dzogchen Ganor Rinpoche. Although like most rituals, such as the monthly tsok (ཚོགས།), at Men-Tsee-Khang, our monastic classmates would lead in the primary set up of the ceremonial objects and assist in the ritual itself, we all participated in the ceremony and took turns through the night reciting the Medicine Buddha mantra that would infuse into the medicine we had collectively made. Again, we as students did not participate in the physical making of the *mendrub* pills; however, our mantra recitations were considered part of the co-creating process of producing the *nüpa* (སྨན་གྲུབ།), or potency, of the pills.

[192] ཕྱུང་པོ་དང་ཁམས་སྐྱེ་མཆེད་དང་རྟེན་འབྲེལ་ཏེ་བདེན་མཐོང་སྒོ་བཞི་ཞེས་བྱགས་པ་སྟེ་འདི་དག་ནི། བོད་ཀྱི་རིག་གཞུང་མཐའ་དག་གི་གཞི་རྩའི་ཤེས་བྱ་ཡིན། (Tamdrin Gyal 2006:14)

> consciousness are condensed in the mind. With the mind, all that has the quality of an object is with concept. The mind makes various terms for all phenomena, material objects, appearances, commentaries, refutations, objects, possessors of objects and so forth. Due to this understanding, one will not become deluded. If one understands the meaning of dependent origination, there will be no essentialism, no nihilism,[193] and no transference. [One will know that] even with a small cause, a great result can occur. One must know that cause and result accord with one another. There is no such thing as phenomena without cause. Without a cause, no action can occur. Through dependent origination, all appearances form.[194]

He describes the importance of gaining valid knowledge through perceptual means and understanding the mechanisms of cause and effect to gain realization of how phenomena really exist. This is clearly not only a pursuit for Tibetan Buddhist practitioners but also Tibetan physicians interested in gaining valid knowledge of a patient's condition for diagnostic purpose.

Tamdrin Gyal introduces his text using Sa-paṇ's arguments for learning Buddhist logic according to its role in proper scholastic education aimed at the ultimate achievement of enlightenment. In his *Treasure,* Sa-paṇ heavily criticizes many of the previous Tibetan commentators on Dharmakīrti's work, many of whom have become integral to Geluk interpretations. Sa-paṇ wrote the *Treasure* with the stated goal of

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[193] "no permanence, no cessation"

[194] འདུས་བྱས་ཚོས་ཀུན་ཕྱང་པོ་ལྟ། འདུས་ཕྱིར་དེ་དག་གཏན་མཁས་གཞི་དང་། རྒྱ་བཙས་འཇིག་རྟེན་ཕྱ་གནས་དང་། ལྷད་པ་དག་ཏུ་འང་བརྗོད་པ་ཡིན། ཤེས་བྱའི་ཚོས་ཀུན་འདུས་པས་ན། དེ་དག་ཟག་བཙས་ཟག་མེད་སོགས། དབྱེ་བའི་རྣམ་གྲངས་ཤེས་པར་བྱ། མིག་དང་གཟུགས་ནས་ཡིད་ཚོས་བར། སྐྱེ་མཆེད་ཅེས་པའི་མིང་སྦྱར་རོ། རྣམ་ཤེས་ཁམས་བདུན་ཡིད་དུ་བསྡུས། ཡིད་ནི་ཀུན་ཐྱི་ཡུལ་ཅན་ཏེ། རྟོག་བཙས་ཡིད་ཀྱིས་ཚོས་རྣམས་ལ། ཇ་ས་བཏགས་སྣང་ས་ལ་འགལ་འཛེལ་བ་དང་། ཡུལ་དང་ཡུལ་ཅན་ལ་སོགས་པའི། ཐ་སྙད་སྣ་ཚོགས་བྱས་པ་ཡིས། ཤེས་བྱའི་དོན་ལ་རྨོངས་མི་འགྱུར། དེ་ལྟར་རྟེན་འབྲེལ་དོན་རྟོགས་ན། རྟག་མིན་ཆད་མིན་འཛོམས་པའང་མིན། རྒྱུ་ཆུང་ན་འང་འབྲས་བུ་ཆེ། རྒྱུ་འབྲས་རྒྱུ་མཐུན་ཉིད་དུ་ཤེས། ཚོས་ཀུན་རྒྱུ་མེད་མ་ཡིན་ལ། རྒྱུ་མེད་གཞན་ལས་མ་བྱུང་སྟེ། རྟེན་འབྲེལ་དབང་གིས་སྣང་བས་ན། (Tamdrin Gyal 2006:14)

refuting Tibetan views that were not supported explicitly by Dharmakīrti's work[195] (Dreyfus 1997:395). Sa-paṇ attempts to retrieve the original thought of Indian texts on logic and epistemology and weave them back into the foundational framework in which they were presented. He also aims to situate Buddhist logic within the greater interdisciplinary education of proper scholarship by integrating and establishing the major knowledge fields into monastic studies. Since Yuthok Yonten Gonpo and his students had already formalized most of Sowa Rigpa studies half a century earlier, the educational foundations for Sowa Rigpa had been put in place once Sa-paṇ rose into prominence.

Because Tamdrin Gyal uses Ju Mipham's *Summary Text on the Four Gates of Realizing the Truth*[196] as the root text for his textbook, and inserts commentaries from Sa-paṇ among others, he provides a clear signal of his own education and lineage. From a young age, Aku Tamdrin Gyal studied and practiced as a *ngakpa* (Lama 2017). He is a primary disciple of Shangsa Lama, one of the greatest lama doctors of contemporary times. Tamdrin Gyal has carried the *ngakpa* lineage from a young age; and although he has many students throughout the Tibetan plateau, especially from teaching in the main medical institutions throughout Amdo, he has only a few students to whom he passed on his full teachings (Lama 2017). Most of these students reside in Amdo— Rebkong, Golok and the surrounding areas (Lama 2017). In addition to his Nyingma *ngakpa* heritage, his studies also come from extensive training in the classical Geluk *shedra*, as well as in the

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[195] Sa-paṇ specifically refutes Chaba's sevenfold typology (Dreyfus 1997:389).

[196] Tib. bden mthong sgo bzhi'i thad kyi sdom byang

non-sectarian[197] education model developed from the Sakya lineage and further developed by Jamgön Kongtrul (1902–1952).

Tamdrin Gyal's presentation provides a strong case for integrating *pramāṇa* theory into Tibetan medical epistemology, ontology, diagnostics and treatment. At SLL, this class was not only part of our standard medical education, but, similar to MTK, it was assumed that we would seek further study during our winter and summer holidays at local monasteries, dialectical schools and with qualified teachers through our own independent resources. I found that many of my classmates pursued further learning during these school breaks, such as traveling back to the monastery in their home village, or further to major learning centers such as Larung Gar. Although only SLL explicitly tested content, and it is well-known that the technicalities of Buddhist logic and *pramāṇa* theory are rigorous and take many years to study in the monasteries, both MTK and SLL expected students to be well-familiarized with the curriculum. In this section, I will introduce only those aspects of *pramāṇa* theory that we learned which are related to the development of embodied knowledge in Tibetan medicine, specifically as relevant to diagnostic applications.

The rest of this chapter outlines the basics of *pramāṇa* theory and how one might cultivate methods of valid cognition as an embodiment process for generating a physician as diagnostic tool. As mentioned in the introduction to this chapter, *pramāṇa* theory provides a corollary to the cognitive neuroscience on memory, metaphor and

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[197] རིས་མེད།

visualization discussed in the previous chapter. I shall now discuss how it shapes a distinctive Tibetan medical ontology and epistemology.

Ontology of the body in Tibetan medicine

Gen Tsering Namjial, professor for our Buddhist Logic and Dialectics class at SLL, started our class with the historical prelude described above from Tamdrin Gyal's text *Principles of the Aggregates, Constituents and Sensory Bases*[198]. Gen Tsering Namjial was a close student of Tamdrin Gyal and assisted Tamdrin Gyal in developing the textbook. After the introduction, where he provides his persuasive argument *à la* Sa-paṇ and Ju Mipham that Buddhist logic is an integral part of medical education, and medical education is integral to the pursuit of enlightenment, Tamdrin Gyal lays out the basics of the ontology of the body. He starts with defining the five aggregates[199], proceeds to the eighteen psychophysical bases[200], then the twelve sense sources[201], and finally the twelve links of dependent origination[202]. We were expected already to have memorized the *Summary Text of the Four Gates of Seeing Truth*[203] by Ju Mipham, four pages of root text at the back of book. The *Summary Text of the Four Gates* covers ten headings, six beyond the ones enumerated in the textbook including location, non-

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198 རྣམ་བཞག་ཕུང་ཁམས་སྐྱེ་མཆེད།

199 ཕུང་པོ་ལྔ།

200 ཁམས་བཅོ་བརྒྱད།

201 སྐྱེ་མཆེད་བཅུ་གཉིས།

202 རྟེན་འབྲེལ་བཅུ་གཉིས།

203 བདེན་མཐོང་སྒོ་བཞི་ཡི་ཐོ་རོལ་བྱང་།

location, sense faculties, time, truth, vehicle, compounded matter, and non-compounded matter. The layout of the textbook is meant to be a compiled contemporary commentary of the root text, drawing upon classic commentaries on the *Abhidharma*. In some ways the text served as a general introduction to *Abhidharma* for my classmates because few had formal Buddhist education up till that point.

The class is viewed as providing the theoretical apparatus for Tibetan medicine as a field (Tsering Namjial 2013), providing the conceptual underpinnings for our anatomy and physiology, pathology and pharmacology, as well as diagnostics and treatment. I viewed it as a course in Tibetan medical ontology and epistemology. Classic Buddhist descriptions of the body or matter of sentient beings relies on the *skandhas*, or psychophysical aggregates. However, in the *Four Medical Transmissions*, I was most familiar with the body described as a composite of the seven bodily constituents, three excrements, and the *nyépa* functional energetic systems. Although the Buddhist ontology is folded within this account since the *nyépa* arise from the three mental poisons, and those from fundamental ignorance, the mode in which these mental events interact with the five elemental principles of matter to give rise to the body was unclear. Explicit linking of the two systems was not present until this Buddhist Logic class.

"The aggregates (*phungbo*) are mounds of things," said Gen Tsering Namjial. "Just like '*lü-pohng*'" he said, using the word for body[204] where "*pohng*"[205] means "bulk" and "*lü*"[206] means "structure", "embodiment," or "remainder"— "that which is left

[204] ལུས་བོངས།

[205] བོངས།

[206] ལུས།

behind." Here, we can see that the mere word for body demonstrates a distinct paradigm in Tibetan medicine. The latter English correlate, "remainder," refers to the body as "all else that is not mind or consciousness." The contrary is often the case in Western discourse where the "mind" or "consciousness" is a mere epiphenomenon of body. Specifically, mind is understood as brain, the physical neuronal and glial connections, and the related transmitter activity (Greenfield 2002). In Tibetan medicine, *lü-pohng*, translated as the body, is a mound of structure housing, or "embodying," the consciousness and mind. However, in reality, the aggregates (*püngbo*[207]) are an integration of psychophysical constituents, illustrating their conceptual integration and inseparability of mental and physical aspects, unlike a Western delineation of a distinct separability of mind and body factors.

There are many aggregates, or *phungbo*[208], that form an individual in the Tibetan ontological view. The verb *büng-pa*[209] is "to amass," and the verb *püngwa*[210], is "to be ruined or destroyed." So a *phungpo*[211], or *skandha* in Sanskrit, is any aggregate of things that can be destroyed or experience disintegration. As mentioned earlier in Ju Mipham's quote, "All phenomena are conditioned including the five aggregates because they are assembled"[212] (Tamdrin Gyal 2006:14). The mind forms the concept that such things are

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[207] ཕུང་པོ།

[208] ཕུང་པོ།

[209] སྡུད་པ།

[210] ཕུང་བ།

[211] ཕུང་པོ།

[212] འདུས་བྱས་ཆོས་ཀུན་ཕུང་པོ་ལྔ། འདུས་ཞིར་དེ་དག་གཅས་གཞི་དང་། (Tamdrin Gyal 2006:14)

an object—in this case, the body. However, the object is formed through assembly from various particulars, causes, and conditions through dependent origination. Thus all parts form, abide, exist, deteriorate and disintegrate. Understanding that the aggregates are a composite of psychic and physical aspects allows one to track the causal qualities that develop, abide and disintegrate.

The five aggregates are enumerated as: form[213], sensation[214], perception[215], formation[216] and consciousness[217] (Mipham c.1900 (2013)). Every sentient being is comprised of these five aggregates. Likewise, what we designate as mind and/or body are aggregations. In this framework it is delineated as collections of form, sensation, perception, formation and consciousness, each with many parts (Mipham (circa 1900 (2013)). Form can be understood as matter. Formation can be understood as the response or manifesting of action[218]. Consciousness is understood as "that which sees an object;" that is, "that which recognizes objects of any phenomena"[219] (Yeshe Gyaltsen 18th cent (2008:8); Mipham (circa 1900 (2013:33)).

Furthermore, parts of the body can also be understood in terms of the aggregates. "The five vital and six vessel organs, the three *nyépas*, the three excrements, the basis of the body and that which creates illness, all may be understood as *phungpo*," Dr. Tsering

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[213] གཟུགས།

[214] ཚོར་བ།

[215] འདུ་ཤེས།

[216] འདུ་བྱེད།

[217] རྣམ་པར་ཤེས་པ།

[218] Defined as "the act of thoroughly creating" (མངོན་པར་འདུ་བྱེད་པའི་མཚན་ཉིད་ཅན།) (Mipham (c.1900 (2013:23)).

[219] རྣམ་པར་ཤེས་པའི་ཕུང་པོ་ནི་ཚོས་རྣམས་ཀྱི་དོན་ཞི་བ་ཁོ་ནར་རིག་པར་བྱེད་པ་སྟེ། (Mipham (c.1900 (2013:33)).

Namjial explained. So the organs themselves would be understood to have aspects that are form, aspects that are sensation, aspects that perceive, aspects that provide formation, and aspects that are consciousness. The *nyépa* are even referred to as accumulations or collections (*düwa*)[220], just as *dü-shé*[221] is the aggregate for perception, literally, "the collection of consciousnesses." This demonstrates why at times blood[222] and *chu-ser*[223] are considered a fourth and fifth *nyépa*, because they are considered "collections" with certain similar properties. In some ways, this can be similarly compared to the Western medical term "tissue," in that it is a collection of cells with similar properties and physiologies that function together for various physiologic applications.

"Regarding the first aggregate, form," Dr. Tsering Namjial said, "One must understand the terminology." "*Zük*[224]," he continued, "can be understood like [the verb form] 'to be planted', 'to be made' — or 'that which is suitable to be placed.'" This mode of using a verb form of a term to define the noun form is a common practice in Buddhist dialectics that I became accustomed to in my classes years prior at IBD, and was the form of question and answer that felt awkward during our first debates as medical students at MTK. It allows for the predicate to be de- and re-constructed into what the questioner is trying to elicit as a contradiction by the responder through various lines of reasoning and illustrative examples (Dreyfus 1997:467). At Men-Tsee-Khang as well, we had to

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[220] འདུ་པ། See for instance in མངོན་རྟོགས་རྒྱན། (TIII Ch 82: pg 463)

[221] འདུ་ཤེས།

[222] ཁྲག

[223] ཆུ་གེར།

[224] གཟུགས།

memorize definitions of basic terms to dissect and dispute on the debate ground. We were instructed to start with these basic phenomena of *zük*[225]—form—and its perceptual qualities, like colors. We learned the basic definitions of primary and branch colors and worked up to more complex concepts like the existence of things. This pedagogical approach is similar to that of our monastic counterparts in the dialectical schools (Dreyfus 2003). For example, in defining a color, the text would read, "A color is something which appears to the eye," and we would use the debate formalities of presenting predicate and conclusion as questioner and responder assert or refute the logic of the proposition. In the debate, the questioner proposed examples to which the responder confirmed such a definition or invalidate it. The definitions often seemed self-referential to me. However, through analysis and use of exemplars, I observed that one could work through the predicate basis and characteristics of the definition to support the concept, specifically by framing it in specific levels of ontological and epistemological analysis. In the same way, we analyzed concepts such as form in their medical applications to understand how they apply to body, mind, health and illness.

"Often when you think there is not a form, there is," Dr. Tsering Namjial continued, using examples to elaborate on the definition. "The sounds that the ear perceives are forms. The ear sensory organ has contact with the sound form and thus perceives it. In the same way, the other senses make contact with their sensory objects." I noted that even the Tibetan word *yul*[226] used for a sensory object carries the connotation

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[225] གཟུགས།

[226] ཡུལ།

of something to touch or contact. Tsering Namjial emphasized this point: all form has the characteristic of being able to be touched. He said, “Sounds, tastes, smells, sights, and tactile percepts—all are forms—our senses contact them. Similarly, the seven bodily constituents, the three waste products, the agents of harm and the objects of harm, the three *nyépas* — *rlung*, *tripa* and *béken* — are all forms,” he said. “However, my cognition[227] is not a form,” said Dr. Tsering Namjial, giving a counterexample, “It cannot be touched with a finger.” Here, “touched with a finger” is a reference to the capacity to contact forms with a sensory organ, such as when sound waves physically vibrate the ear drum, and those vibrations transfer to the ossicles of the inner ear to transmit neural signals to the brain vis-à-vis thousands of tiny hair cells in the cochlea — a mechanical-electrical-chemical process. Contact does not refer to actually feeling sound wave forms, for example, with one’s hand. So sound waves, light waves, taste particles, odor chemicals and so forth all have a form that “contact” the sensory organ to be perceived.

Dr. Tsering Namjial reviewed how each of the conceptual terms he introduced has a specific definition or set of characteristics[228], a classical basis of predication[229] and an etymology[230]. The definition of *zük*[231] is “that which fulfills the function of form”[232] (Tamdrin Gyal 2004:14; Jamphel Drakpa 2011:24). This definition may seem opaque and

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[227] ཤེས་པ།

[228] ཁྱད་ཆོས།

[229] ཁྱད་གཞི།

[230] སྒྲ་བ་ཤད།

[231] གཟུགས།

[232] གཟུགས་སུ་རུང་བ།

of little use at first; however, it creates a foundation to assert, or contend with, the other aspects of designating this concept. One example of a basis of predication for *zük* is a water-jug[233]. Giving examples comparing other objects to a water-jug to create a contradiction within the definition of form for itself or other objects is a frequent line of debate in predicate and response. In describing the etymology of *zük*, our textbook explains that something that has form[234] is "that which can functionally cause change"[235] (Tamdrin Gyal 2004:14; Jamphel Drakpa 2011:24).

These explanations fit with my understanding of the mechanics of perception—the physics of light and sound and how photons and sound waves impinge on photoreceptors and the ear anatomy to transmit neural signals as percepts in the brain. These understandings of perception fit with the biology of taste, smell, and touch—the physicality of specific molecules contacting and binding to gustatory, odor, and tactile receptors to create perceptual experience.

"We have to remember that there are different schools, or levels of analysis," continued Dr. Tsering Namjial in my mentoring session with him, "With the students, I do not go into the highest level of analysis; I just introduce the Yogācāra[236] perspective.

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[233] བུམ་པ།

[234] གཟུགས་ཅན།

[235] The definition relies on the verb "to hurt," or "to impair" (གནོད་པ།) in that which has form has the capacity to cause form. However, it is clarified in that "to cause harm" means to be able to "produce a change." The definition reads: "The etymology of that which has form is "That which has form is suitable to produce harm. This is a means of saying, "That which has form is named such because it is able to produce a change." སྒྲ་བ་ཁང་ནི་གཟུགས་ཅན་གྱི་གནོད་པ་བྱ་རྒྱུ་བ་སྟེ་གཟུགས་ཅན་གྱི་འཇུར་བ་སྐྱེད་པར་བྱ་བ་ཡིན་པས་དེ་སྐད་ཅེས་བརྗོད་དོ། Jamphel Drakpa 2011:24)

[236] Mind-Only School

For *zük*, it is not that it is actually something; it is merely characteristics of phenomena that we are talking about." I asked, "Could we say that it is similar to atoms which have certain properties, but when we go looking for the substance that they are made of, we find that they are largely made of nothing—just energy and empty space?" I knew Dr. Tsering Namjial was quite familiar with modern physics from his exposure to the lay audience writings on physics in English and his tenure in a graduate program at UCLA studying statistical analysis and bioinformatics, and auditing a myriad of physics and biology classes. The past couple decades of discussions between physicists and Buddhist logicians (Dalai Lama et al 1999; Dalai Lama 2006) was familiar to Dr. Tsering Namjial so this analogy was common. "Yeah," said Dr. Tsering Namjial, "That is a good question." He continued skillfully using the classical Buddhist term for particles as synonymous with the term for atoms, "We know that particles have sides because you can accumulate them. Without a side, saying that one is on the right side of the other, and so forth, they could not be accumulate-able. They would be pointless particles without occupying space. However, precisely because they occupy space, we can accumulate them. Like the *Heart Sūtra* says, 'Form is emptiness, emptiness also is form.' They exist in terms of occupying space, but they do not ultimately exist. In the same manner, our body is comprised of matter which has form, that is, the characteristics of form, but it is also empty of inherent existence in other ways." In this way, the English translation of "matter" could be used as well as "form" for *zük*.

I remembered the *Heart Sūtra* explicitly described this about the five aggregates:

> The Perfection of Transcendent Wisdom sees in this way: seeing the five aggregates to be empty of nature. Form is emptiness; emptiness also is form. Emptiness is no other than form, form is no other than emptiness. In the same way, feeling, perception, formation and consciousness are emptiness.[237]

I enjoyed the discussion because it reminded me of what motivated me to study physics at Stanford—gaining a greater understanding of the nature of reality—and such descriptions were used consistently in our dialectic courses at IBD. However, I had rarely heard the description relating Buddhist particles and Western physics atoms used so explicitly for the body in the Tibetan medical context.

I found the physics understanding of atoms, quarks and nanoparticles as a useful framework for understanding Dharmakīrti's description of particulars and their objective aspects that appear to perception. The language of pointless particles is present in Dignāga's work, as followed later by Dharmakīrti as well. As Dreyfus describes, Dharmakīrti's thinking concerning external objects follows that of Dignāga's: "A material object is perceived through the intermediary of its representation or aspect (*ākāra, nampa*[238]). Each of its atoms causes a perception that has such representation to arise so the we see such an extended object. Thus, the impression is a result of the aspected perception, not a reflection of the way atoms exist" (Dreyfus 1997:102). This is the same understanding in modern physics: atoms, quarks and the most minute particles of all matter only exist in the effect they have on their causal relations. The particles themselves

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[237] Provide Tibetan and cite MTK Daily Prayers book.

[238] རྣམ་པ།

cannot be characterized by any form of solid material; they are mere vibrations of energy that have properties through causal relations.

As Dharmakīrti asserted, the aggregates are also considered conceptual constructs that, though useful for facilitating analysis, can inhibit understanding how the body exists in reality. They can also become conceptual obstacles. Concepts are conventional realities developed as practical tools, but with little basis in ultimate reality. Their conventional existence, however, can become hard to see when the conceptual framework becomes an integral part of a societal perspective. From the anthropological lens, this is how culture works. For example, the way in which Western medicine delineates the body according to systems of organization such as skeletal, muscular, nervous, and endocrine systems become a naturalized way of viewing the body such that their conventional designation blinds one to what other potential system designations could exist or the interrelatedness across the systems. We know that fluids, metabolites, hormones, enzymes, energy exchanges and so forth occur across systems, organs, tissues and cells — they are not isolated entities or closed systems. Likewise, the aggregates do not inherently exist on their own part. They are conceptual constructs which we have designated for the functional purpose of manipulating the body for depicting function, delineating

anatomical objects, enacting treatment, and so forth.[239] As in Western medicine, Tibetan medicine creates certain designations such as the *nyépas* that are useful in describing and manipulating the body toward the purpose of health, personal development and so forth. They are systems of qualities, anatomy, and function to track for disease and health. However, such designations also do not exist inherently.

The exchange of particles, cells and so forth with the external world and their related qualities is dynamic in nature. Tibetan medicine frames these exchanges of particles and properties through the five principle dynamics, the *jungwa nga*[240]. I choose to translate *jungwa nga* as "five fundamental properties" to highlight the qualities and properties that they impart to form, sensation, perception, formation and consciousness, not the actual material form of "elements" or "atoms" per se themselves. The term "elements" can also convey both a meaning of properties, such as the periodic table of elements, as well as substances themselves. However, the conceptual slippage to see them as concrete material forms seems greater with the term "elements" than "properties." They are also known as the five dynamics (Cuomo 2010, 2011), five elementals

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[239] For example, the aggregates also appear in what is called "the four māras" (bdud bzhi, catvāri māra), obstructed forces that impede progress on the spiritual path, namely, lasting happiness (Pelzang 2004; Mipham 2004). According to the Sutras, the four māras comprise the māra of the aggregates (phung po'i bdud, skhandamāra), māra of afflictive emotions (nyon mongs kyi bdud, kleśamāra), māra of death ('chi bdag gi bdud, mṛtyuamāra) and māra of the sons of gods (lha'i bu'i bdud, devaputramāra). The māra of the aggregates symbolizes the tendency to cling to forms, perceptions, mental states and so forth as inherently existing. The māra of destructive emotions symbolizes the tendency to cling to habitual patterns of these afflictive emotions. The māra of the Lord of Death symbolizes the fear of change, impermanence and death, and actual death which cuts a precious human life short. The māra of the sons of gods symbolizes our clinging to the state of pleasure, convenience, and a semblance of contentment and peace — as one might experience in the god realm. There are also the four *māras* of the *vajrayāna*, which I will not discuss here. The aggregates comprise innumerable ways to delineate categories and boundaries of matter and experience. They qualify as one of the potential obstructing forces to a correct view of reality simply because it is easy to rely on such conventions without recognizing their constructed natures as mere concepts that can change with greater understanding of how things exist.

[240] འབྱུང་བ་ལྔ།

(Rangjung Yeshe Dictionary, THLIB), and five great elements (THLIB). The five fundamental properties is a key concept for Tibetan medicine because they ground a view of the body as dynamic, interdependent, and constantly changing. And they provide the basis from which Tibetan medicine tracks pathways—functional and deviant—in the body, as well as providing the classification schema of organs, bodily constituents, and excrements—all that comprise the body in form and function. And *this* is Tibetan medicine's distinct view of the body that draws upon an ontological perspective of dynamically changing psychophysical constituents.[241]

As Dr. Tsering Namjial described, the five aggregates are the body; they are that which, when assembled, becomes perceived as a recognized whole. However, the body itself does not exist independent of these assembled parts, and the moment-by-moment re-capitulation and regeneration of these parts sustains the body, re-creates it to sustain life, and incites the decline and disintegration transitioning towards death. What we ingest into our body—the food we eat, the water we drink, the air we breathe, the solar energy we receive—becomes the raw material for generating our bodily constituents, one from the other. The *Four Medical Transmissions* describes this successive constituent generation as nutrient essence, to blood, to muscle tissue, to adipose tissue, to bone, to bone marrow, and finally to regenerative fluid[242]. This is why Tamdrin Gyal is insistent that Tibetan medical education re-integrate studies in Buddhist ontology and

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[241] Contrast to the conventional view of the "body" as referencing a given anatomical structure or physiologic function, details of a given sensorimotor system or a given world of habits, norms, skills and so on (DiPaolo & Thompson *forthcoming:* pg 2).

[242] དྲྭངས་མ་ཁྲག་འཚོལ་རྒྱས་ཤང་ཁུ་བ། (TII, Ch 5)

epistemology because it *is* Tibetan medical ontology and epistemology, from both the historical basis as well as the contemporary paradigm.

Such qualities and properties can be tracked in pathways in the body as well as attributed to the diagnostics and the very treatments applied to a given condition. Diet, lifestyle, mental patterns, medicine, and therapies all are classified according to these qualities and properties. *Chu-ser*, literally "yellow fluid," tracks the fundamental properties of *chu* and its associations with *béken*. *Chu-ser* is a composite term for intra- and extracellular fluid, blood serum, lymph, and cerebral spinal fluid, which have common interfaces that share fluid and metabolites across and through the body's cavities. This common metabolism of fluids and metabolites is understood in Western medicine, but not given a single term as it is in Tibetan medicine. Thus, *chu-ser* is both understood through the properties it enacts—lubricating, dispersing, exchanging (e.g., metabolite)—and also its material form as liquid that can be quantified and weighed. Likewise, the bodily constituents are categorized in terms of the properties each enacts, but also the material form. The material form can change and by the change in the properties enacted, it may become a new constituent.

This Buddhist model of ontology that provides the foundation for the Tibetan medical ontology can now be applied to understand the attendant epistemology for how cognition is understood and the means through which one gains valid knowledge for diagnostic application in *pramāṇa* theory.

Buddhist model of cognition: *Pramāṇa* theory

Pramāṇa theory explicates "instruments of knowledge," and was a style of discourse among South Asian philosophers used as early as first century CE to examine epistemological paradigms and supporting logic (Dunne 2004:16). *Pramāṇa* theory is primarily concerned with "the determination of what constitutes indubitable or indisputable knowledge and the reliable means of attaining it" (Dunne 2004:16), particularly "when it guides action (*pravṛtti*) relative to a human aim (*puruṣārtha*)" (*ibid*). Particularly for Dharmakīrti's approach to *pramāṇa* theory, the most reliable form of evidence is that which one obtains through perception because it is the most direct form of knowledge. All other forms are mediated through an inference, verbal testimony, or other forms of instrumentation. In Tibetan medicine, the reliance upon perceptual means for valid evidence in differential diagnosis is not just practical, but has an intellectual history that privileges perception over all other means of gaining trustworthy knowledge.

I began learning *pramāṇa* theory with John Dunne, an eminent scholar of Dharmakīrti, during my first years of doctoral work at Emory. The theory struck me as highly relevant to how Tibetan medicine understands diagnosis and the methods it uses to entrain the skill as embodied knowledge to deploy in differential diagnostics. I had no idea that years later during my Tibetan medical education, this would be presented by the Tibetan medical tradition itself as part of our curriculum, and would be overtly referenced in the diagnostic sections of the medical texts themselves by using classic *pramāṇa*

examples for illustrating proper diagnostic methods as well as listing the classic possible cognitive errors.

Since a wide number of commentators have interpreted Dharmakīrti over the centuries, I will not attempt to recount the tensions among schools of thought in interpreting Dharmakīrti[243], nor will I recapitulate particularities specific to his Tibetan interpreters. I use *pramāṇa* theory generally as it was inherited through the Indic epistemological and ontological context that fed into both the medical systems that developed in India and Tibet (Zysk 1991, 1993; Ga 2014) and I use a specific understanding of Dharmakīrti that frames the learning processes undergirding Tibetan medical diagnostics. Of the four major sects within the Tibetan Buddhist tradition, Dharmakīrti's theory of perception may be most resiliently retained among the Sakyas, and consequently with the Nyingmas and Kagyus (Dreyfus 1997:2).[244] The Nyingma, or "old sect" was the first to arise in Tibet and is most closely connected with the development of Tibetan medicine (Garrett 2006, 2014). The Sakyas and Kagyus were two of the "new school" sects (along with the Geluk school) and arose in the early 11th century. The Geluk school is the newest school, arising in the mid-fourteenth century under the leadership, scholarship, and realizations of Je Tsongkhapa. The nonsectarian (*Rimé*[245]) movement in Tibet involves the Nyingma, Kagyu and Sakya schools of Tibetan Buddhism and arose in the early 19th century in an effort to compile the teachings of the

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[243] For the distinctions among Tibetan thinkers see Dreyfus's *Recognizing Reality* (1997); for those of the Indian tradition, see Dunne's *Fundamentals of Dharmakīrti* (2011); and for a comparison with the Śaivite tradition, see Prueitt's dissertation manuscript (2016).

[244] The Gelukpas interpret Dharmakīrti's theory of perception distinctly differently (Dunne 2011b).

[245] རིས་མེད།

various schools. In many ways, the *Rimé* movement was a response to the dominance of Geluk institutions in Tibet's cultural and intellectual life. It was also an effort to counter the belief that one's school had the highest philosophical view or more efficacious practices by encouraging practitioners to be well-versed in the teachings of the other schools and to engage in nonpartisan debate and discussion to develop greater scholarship and practice overall. Although we learned the Geluk interpretation of Dharmakīrti's work at MTK, I will focus on the Sakya, Nyingma, and Kagyu nonsectarian interpretation since that is the presentation given at SLL, where I experienced greater in-depth study and analysis of Dharmakīrti[246], and which is most consistent with the way the learning processes are described and the way Dunne presents Dharmakīrti's work.

Dharmakīrti's model of cognition

Dharmakīrti provides a causal and descriptive model of cognition, which is an embodied cognition that encourages a minimalist approach to concepts, yet recognizes the proper use of concepts in directing successful human action (Dunne 2011a: 86). In order to provide a summary of Dharmakīrti's approach to concept formation, I will draw from Dunne's incisive description of apoha theory (2011a). Dharmakīrti's work can be treated as an extension of the *Abhidharma* tradition, as discussed above, and upon which it is based (*ibid*). It focuses on a causal mode of cognition with physiological and psychological elements presuming that "any causally efficacious thing endures for only an instant," and as such the model describes the causal interaction of momentary entities

[246] That is, between Men-Tsee-Khang and Sorig Loling.

(Dunne 2011a: 86). Such a model allows for Dharmakīrti's particular causal approach to cognition to engage as a productive interlocutor with cognitive neuroscience approaches to memory and embodied cognition as described in the previous chapter. In Dharmakīrti's model, these momentary entities of physiological and psychological elements are related to each other in such a way that one moment acts as the primary cause for the next in the sequence. Thus, if one is observing the yellow-red color of a urine sample, the matter constituting the perception of this color endures only for an instant. Nevertheless, the color appears to endure longer because the matter constituting that entity occurs in a sequence of moments of that matter where each instance arises from the previous moment of matter and dissipates as it produces the next. This causal sequence of momentary arising and perishing is the same with the matter that constitutes the body, the sense faculties, the organs, a pulse, and so forth. In the case of consciousness from this perspective, the causal sequence constituting the flow of consciousness is comprised of momentary entities—though entirely mental, not material, in nature (Dunne 2011a: 86).

Each moment occurs under particular causal conditions. In the act of recognition when a perceived object, such as the color of a urine sample, is labeled "yellow-red," there are three causal streams that comprise the event: (1) the causal stream of the matter constituting the perceived object; (2) the causal stream of matter constituting the sense faculty; (3) and the immaterial causal stream constituting the mind (Dunne 2011a: 87). As Dunne describes, each of these streams is reducible to discrete, causally efficient moments—each of which endures for only an instant. In one moment, when a sense faculty comes into relation with an object, under certain conditions in a subsequent

moment, a phenomenal form of the object arises in the mind. This phenomenal form is not an identical mirror image of the object because the phenomenal appearance of the object is conditioned by various factors other than the object, such as various cognitive and affective features of the previous moment of mind, and the state of the sense faculty engaging with the object. However, under specific "epistemically reliable contexts," the phenomenal form does bear a resemblance (*sārūpya*[247]) to the moment of the object that created it such that the causal characteristics of the object restrict the relevant causal characteristics that generate the phenomenal form (Dunne *forthcoming*:87). This is the close fidelity between the object's causal characteristics and that of the phenomenal form, say the color of a urine sample appearing to the physician's eye faculty, that Tibetan medicine relies upon for diagnostic recognition.

In this embodied cognition model, the phenomenal form that arises through sensory contact is nonconceptual, and has not undergone what Dharmakīrti calls the *apoha* process, that is, the cognitive selection of a subset of characteristics to form concepts or universal generalities. *Apoha* is the process of concept formation by forming exclusions. Under the right conditions, a subsequent moment in which the *apoha* process occurs provides a phenomenal form that is conceptual in this moment of mind. In the third moment, the conceptualized form loses "the vividness or clarity that is characteristic of the perceptual form," generating an unclear form. Thus, the conceptual cognition of recognition following the nonconceptual cognition can lose some degree of phenomenal clarity. Retaining a greater degree of clarity, particularly that is meaningful to the purpose

[247] འདྲ་བ།

of diagnostic relevance, is the focus in Tibetan medicine for drawing inferences from reliable perceptions that have causal efficacy to identify and address disease in an individual. Phenomenal clarity, for Dharmakīrti, has an embodied phenomenology, which is important for the diagnostic application in Tibetan medicine.

For Dharmakīrti, a concept, as Dunne translates from one of Dharmakīrti's last works, "is a cognition with a phenomenal appearance that is capable of being conjoined with linguistic expression" (Dunne 2011a: 87). This does not mean that it must be expressible, since concept formation precedes linguistic expressibility in humans and animals. However, it denotes that two things can be identified as the "same." So although ultimately unique in momentariness and particularness of a phenomenal instant, a *rlung* pulse can be identified similar to other instances of *rlung* pulses, in that they share characteristics of being different from all the instances of matter that create phenomenal forms that are non-*rlung* pulse. That is, they share categorical sameness by negation. In other words, they share a sameness based on their difference from other objects. Furthermore, this negation is based on the "telic function" or purpose for which that object is engaged. One ignores the other capacities that distinguish that object from others depending on which capacities are relevant to one's goal. For instance, the container in which the urine sits also presents a phenomenal form, but in many instances one ignores these characteristics in order to attend to those which are creating the phenomenal form of the urine color. One may not even notice that the patient has switched containers, if they are equally suitable to hold the urine and one is focused on the diagnostically relevant features of the urine itself. It is the purpose for which one is engaging with an

object that directs the subset of causal capacities relevant to one's telos or goal (*artha*[248]). Purpose directs the cognition to attend to the subset of causal capacities related to one's goal.

Diagnostic indications in the *Four Medical Transmissions* direct the physician to the perceptual cues that are diagnostically relevant to the goal of recognizing illness in the patient in order to treat it. This is the subset of causal capacities to which the physician attends. As the stanzas delineating these perceptual cues are recited, new imprints[249] are created in the consciousness of the physician that will interact with the causal capacities of the diagnostic object when the physician actually diagnoses a patient. Each repetition of recitation of these stanzas create new imprints that reinforce the subset of causal capacities that will appear in the phenomenal form. These imprints are activated when the physician sees an actual patient such that the subset of causal capacities of the diagnostic object, say the tautness of the pulse, will become more vivid when the sensory faculty actually engages with the object. I will discuss this further soon, but first, I will introduce Dharmakīrti's ontology.

Dharmakīrti's ontology

Dharmakīrti is concerned with how conventional experience works within a specific soteriological framework. Most of Dharmakīrti's work draws upon what Dunne describes as an "External Realist" framework that grants the existence of external objects

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[248] དོན།

[249] བག་ཆགས།

as described in the model of cognition above (Dunne 2004).[250] This can be seen as skillful means in dialoguing with other pan-religious *pramāṇa* theorists of the time as well as speaking to Buddhists with the more paradigmatic view in that context. I will focus on his External Realist perspective in my analysis of how Dharmakīrti's and general *pramāṇa* theory are implemented in Tibetan medical education for diagnostic training.[251]

Dharmakīrti's External Realist level of analysis points that only things that are "unique, momentary particulars" are ultimately real (Dunne 2004:58). In order for something to be real, it (or its effects) must "impinge on the senses" (Dunne 2011a: 89). This interaction requires a causal process that produces a perceptual phenomenal form. Causal efficacy requires change, and thus is incompatible with universals which are necessarily temporally and spatially distributed, such as concepts. In this account, a particular (*svalakṣaṇa*[252]) is described as a momentary, utterly unique, and ultimately real entity (Prueitt 2016:35). Dharmakīrti draws on Vasubandhu in asserting that only the ultimately real is irreducible (Dunne 2004:81). In this account, real external particulars produce a phenomenal form. It is at this level of analysis that we find particular currency for the training methods for Tibetan doctors to cultivate their perceptual skills in

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[250] The other major scale of analysis Dharmakīrti engages is what Dunne describes as an "Epistemic Idealist" perspective, which is based on Vasubandhu's Yogācāra view (2014:66-67). Dharmakīrti eventually moves to a final ontology in which he critiques the apparent cognitive differentiation of subject, object and awareness. This leaves only nondual reflexive awareness in his final level of analysis (Prueitt 2016:35).

[251] It is important to note that each scale of analysis that Dharmakīrti employs is internally consistent and can be applied appropriately in its respective way to Tibetan medical education methods. I will not address each scale of analysis in this work but mention them for context.

[252] རྐྱེ་བྲག

diagnostics. Tibetan medical texts highlight the perceptual cues[253], that is, concepts describing perceptual characteristics that put constraints on the arising phenomenal forms. It is the characteristics of the phenomenal form that the Tibetan physician must assess in order to make diagnostically relevant determinations of what he or she is perceiving when examining the patient.[254] These phenomenal forms provide a basis from which practical activity (*vyavahāra*) arises within the conventional world, such as using the aspects to recognize the given imbalance that determines illness. Furthermore, these phenomenal forms provide a means of a trustworthy awareness (*pramāṇa*[255])—in the Tibetan medical case, a means of gaining valid evidence—if they produce a determination (*niścaya*[256]) that leads to the attainment of the perceiver's object (*arthakriyā*[257]). In the Tibetan medical case, the determination would be a differential diagnosis, and the attainment would be a clear assessment of the diagnostic object, and the consequent inference of the diagnosis.

A trustworthy awareness (*pramāṇa*) can know two kinds of objects: the particular (*svalakṣaṇa*[258]) and the universal (*sāmānyalakṣaṇa*[259]). Only particulars are cauJenny efficacious because they are not distributed, and only objects that are not distributed are

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[253] རྟོག་པ།

[254] Whether these aspects are presented by the object themselves or manifest through the interactivity between the cognition perceiving the object and the apparent form of the object—that is, an epistemic idealist ontology—is outside our discussion in this current work.

[255] ཚད་མ།

[256] ངེས་ཤེས།

[257] དོན་བྱེད།

[258] བྱ་བྱེད།

[259] སྤྱི།

fit for causal efficacy. Dharmakīrti follows Vasubandhu in asserting that an ultimately real thing must be partless, and Dignāga's view that such a thing must be inexpressible (Dunne 2004:77-80). The ultimately real must be "utterly unique" in the sense that it is not distributed spatially, temporally, or linguistically. Universals, by contrast, are distributed over both time and space, and thus, have parts that are expressible linguistically. Consequently, universals can only be conventionally real.

Perceptual awareness for *pramāṇa* theorists is a way of knowing that which relies directly on the senses. However, compared to Euroamerican thinkers who recognize five senses, *pramāṇa* theorists agree on a sixth sense: the mental faculty (*manas*[260]) (Dunne 2004:23). Thus, "any instance of 'perceptual awareness' may be an awareness of a mental object, rather than a visible form, sound, smell, taste, or tactile object" (Dunne 2004:23). Likewise, *pramāṇa* theorists also agree on the mechanics of how perceptual awareness works. Perceptual awareness requires a sense faculty (*indriya*[261]), contact (*sannikarṣa, sparśa*[262], etc.), and an object (*viṣaya*[263], *artha*[264], etc.). Such contact, except for mental objects, requires that the contact involve matter (*rūpa*[265]) or substance (*dravya*[266]) (Dunne 2004:24). *Pramāṇa* theorists also agree that physical defects in the sense faculties can contribute errors in perceptual awareness (Dunne 2004:23). For example, a person with

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[260] སེམས།

[261] དབང་པོས།

[262] རེག་པ།

[263] ཡུལ།

[264] དོན།

[265] གཟུགས།

[266] རྫས།

ocular floaters may perceive hairs or bugs on the objects that their eye faculty contacts. Here, we see the Tibetan medical relevance in that physical defects in the sensory faculties would certainly affect a Tibetan physician's ability to employ a reliable diagnostic assessment. Lastly, *pramāṇa* theorists agree that perceptual awareness takes precedence over other instruments of knowledge, such as inference, because perceptual awareness is the "least mediated" and "most vivid" form of awareness (Dunne 2004:24). Such a notion sets the stage for the physician to use her sense faculties as a primary diagnostic instrument, and to make sure such faculties are in optimal functionality. 'Vividness,' again carrying the connotation of embodied affect, a physiological response.

Since Dharmakīrti views perception as a causal process, and only particulars are causally efficacious, only particulars are the objects of perception (*pratyakṣa*[267]). As Dunne describes: "First, a perception is the effect of its object. Second, only ultimately real entities produce effects. Therefore, only ultimately real entities—particulars—can be the objects of perception, for only ultimately real entities—particulars—produce effects" (Dunne 2004:85)[268]. One of Dharmakīrti's perspectives on causality is that what makes an external object real is that it is enmeshed in a causal web of interactions. In Dharmakīrti's view, the conceptual framing of causes and conditions is an act of exclusion (*vyāvṛtti*) — excluding those entities that do not have the expected effects or causes. However, in reality, there are infinite causes and conditions participating in a

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[267] མངོན་སུམ།

[268] Prueitt points out that in Dharmakīrti's early discussion of non-perception (*anupalabdhi*), he states: "existence is just perception" (Prueitt 2016:40) and references: sattvam upalabdhir eva, PVSV ad 1.3 (Dharmakīrti 1960, 4). For additional discussions of this passage, see Steinkellner (1994) and Dunne (2004, 85) (ibid fn 22).

given event. As Dunne describes, "To speak of a rose, for example, as having a property of 'being a flower,' we construct an exclusion whereby that entity is excluded from all entities that have not arisen from the causes that produce flowers and that do not have the effects expected of flowers" (2004:156).

Universals can be known through inference (*anumāna*[269]). They are neither unique nor momentary,[270] since they distribute across spatial and temporal relations, yet they play an important role in mediating knowledge. Dharmakīrti describes how we are inclined to carve up the world in terms of universals—agents, objects, and actions—using the *apoha*[271] process. This is a process of concept formation by making a universal or a non-momentary and non-particular construct out of phenomena through a temporal and spatial distribution of a universal, that is, a concept, across the real particulars presented to the perception. This distribution is not real or true to the object itself since it is a constructed entity that cannot retain the momentariness and particularness of the object and its perception itself.

Ultimately, Dharmakīrti is concerned with the deleterious ramifications of seeing the world through universals. The most problematic universal for Dharmakīrti is the concept of a self-sustaining, permanently existing self. We will not explore this area of his philosophy here, but I mention it as an example for understanding his view that

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269 རྗེས་དཔག

270 Dharmakīrti follows Vasubandhu's arguments in the Abhidharmakośabhāṣya which Jonathan Gold summarizes, "for Vasubandhu, to say that an entity exists means that it is actively engaged in causal relations with other entities. It makes no sense to imagine an existent entity that fails to produce its causal result, because in such a situation an entity is not an existent" (Gold 2016:57). For Dharmakīrti, as with Vasubandhu, only objects currently engaged in causal relationships are real.

271 སེལ་བ།

concepts and universals are equivalent, and the potential consequences in these cognitive conclusions. A concept is necessarily a universal because of its temporal extension and lack of uniqueness. If an object is being named, it is repeatable and, thus, universalizable to selected other objects. There is the distribution of sameness across particulars, which as we have discussed, are actually unique and momentary. In the act of assigning a name to a thing, one negates phenomenal content that is commonly not of the causal characteristics of the object one is engaging. The "thing" one is engaging loses both its momentariness and its uniqueness. Phenomenally, it looks less intense because it is less rich. Various details have been ignored or reified from a momentary experience—selecting less content than its full phenomenal form.

Clearly, we need universals in order to engage in the conventional world. The process of negation that *apoha* describes is useful and critical to mundane human interaction and living: we need concepts—objects, actors, and agents—to engage in the world. It is also critical to Tibetan medical diagnostic learning. Though necessary, one must recognize that this process can also be misleading. One is actively selecting content and labeling it. Each entity does not exist in the way that it has been labeled nor does it have meaning on its own side. Understanding that it is the meaning-maker, namely us, that provides this conceptual content is a critical aspect for Dharmakīrti in understanding the limitations, and consequent debilitations, of the *apoha* process.

However, one's purpose for drawing inferences from perceptual content allows one to track the causal efficacy between perceptual stimulus and determination to achieve a telic efficacy, or aim in using the knowledge, say for healing the body in the Tibetan

medical context. I will address this more shortly, particularly in the manner that, in *apoha* theory, individuals create a conceptual construct from a perception of an external object that reifies, ignores, or augments the perceptual content of what one perceives, but that the cognitive event itself is necessarily momentary and particular (Dunne 2004:130).

For Dharmakīrti, only cognitions that are telically efficacious, that is, employed for a specific purpose, are real (Dunne 2006:140), and thus can be trusted to guide action. In this sense, Tibetan medicine relies upon perceptual cues[272]—concepts that describe perceptual data to which one must perceptually attend—that invokes an object's mental representation[273] for which an inference is made for the purpose of healing the patient. Such perceptual cues attend to the perceptual data and are applied only in so far as they are telically efficacious in tracking imbalance and manipulating them to re-establish health because they aim to relieve the suffering of the individual and cultivate conditions for that individual to participate in mundane activities as well as an aspiration that the person will seek to gain ultimate spiritual realization and release others from suffering.

In our everyday lives, we use various terms to designate objects. They are neither given arbitrarily, nor do they directly correspond to what exists. For example, we may recognize a track on the ground as a coyote track, but it is also compressed soil in a specific tapestry of the landscape. When we designate an object, we are referring to a subset of the components of that object constructed from eight components (Dreyfus 1997:102). These are the four components of solidity (the quality in solid matter referred

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[272] རྣམ་པ།

[273] *ākāra,* here the Tibetan would be ཤེས་པ།, not རྣམ་པ།

to as the earth principle), adhesion (the quality of moisture referred to as the water principle), heat (energy generated by the vibrations of molecules, referred to as fire principle), motility (the actual movement of molecules, referred to as wind principle), and the four spheres of sensory objects (form, taste, smell, and tangible aspects). Our senses apprehend different parts of these aspects. For example, our eye faculty apprehends color and shape, tangible aspects are apprehended by our body faculty, smell by our nose faculty, taste by our tongue faculty, and so forth. Likewise, the senses have specific capacities (e.g., their receptors) that allow them to only apprehend certain perceptual characteristics and not overlap.

In what I call the conceptual-perceptual dialectic, a dynamic shifting occurs between perception and inference that retains a fidelity to the causal efficacy of the object based on the aim employed. That is, one must have confidence that the phenomenal form one is apprehending has a consistent causal relationship with the perceptual object one is engaging. Related to this function, Dharmakīrti speaks of nondeceptiveness (*avisaṃvādanam*[274]) as characterizing an object's "readiness to perform a function that relates to the way it is cognized" (Dreyfus 1997:289). Nondeceptiveness refers to apprehension of the object in accordance with the latter's causal dispositions. For example, the nondeceptiveness of the perception of fire is the apprehension of the latter as burning, heating, cooking, and so forth, which is nondeceptive since it practically corresponds to the object's own dispositions. By contrast, if there was an apprehension of the fire as cold, it would be deceptive because it inadequately grasps the object according

[274] མི་སྐྱུ་བ།

to its causal dispositions. Dharmakīrti's account has an important practical and behavioral emphasis (Dreyfus 1997:289).

In the same way, this theory of valid cognition demonstrates a system of training and applying one's perceptions of objects, namely the body, pulse, and so forth of a patient in the case of Tibetan medicine, through a proper application of certain conceptual constructs that have been established and allow for the perceiver to access the perceptual data in a more practical way. This is the embodied means of making a diagnosis. It is critical for physicians to be able to rely on their embodied means of instrumentation, namely, their sensory faculties, in determining the state of imbalance in the patient and tracking the causal conditions that led to that imbalance. Hence, this is the looping of the conceptual-perceptual dialectic important in the training process.

In the case of memorization in Tibetan medical education and the familiarization with various principles and constructs, the aim is to cultivate a certain type of seeing—the physician as instrument—so that the perceptual experience is meaningful and provides a presentational apprehension that facilitates apprehending an object as causally efficacious, that is, observing its practical dispositions and behaviors. In some sense, one could say that it is providing a language of referents to real objects to see and identify, as well as providing a basis for assessing causal efficacy in which the behaviors are described textually and one must assess how they function in practice. Repeated observations may allow one to apply inference with greater fidelity to the causal efficacy of the particular. However, one must be careful to take each perception as unique; though similarities may be apparent to other instances of observation. Diagnosis can be seen as a

process of analyzing single moments over time, not a single event that is generalizable. Repeated observations are important to create diagnoses that are causally and telically efficacious. Instead of mere conceptual repetition, it allows for one to make a demonstrable link to the diagnostic object vis-à-vis to valid cognition of the object. As Dreyfus describes, "Memory may be relevant to the production of further knowledge. For example, memory is involved in references, but the knowledge that results from the inferential process is a new conclusion" (1997:290-1).

If a valid cognition identifies its objects according to certain characteristics (Dreyfus 1997:302), then Tibetan medical diagnostics can provisionally rely on perceptual features in its diagnostics (and likewise in matching those properties with similar properties in treatment). For instance, since *rlung* has the characteristics of being light, mobile, cool, rough, hard and subtle, applying a treatment that is steady, warm, smooth, gentle, and nutritionally- or therapeutically-dense, such as medicated oil compresses and massage, would be helpful. The perceptual features of *rlung* direct both diagnostic objects as well as therapeutic applications. These features create a resilient consistency of causally-related pathways across phenomena in the body to be tracked perceptually by the physician in assessing and treating the patient. So for example, the qualities of the five dynamic principles (that is, the five elements) compose the tastes, post-digestive tastes, potencies, and qualities[275], of which the *nyépa* are also comprised. In the same way that we characterize a molecule's behavior according to its elemental components that retain certain properties on their own and synergistically in combination

[275] ཡོན་ཏན།

with other atoms and elements, in Tibetan understanding, these principles behave in certain ways on their own, and transform as they interact synergistically, neutrally, or antagonistically with other principles.

For Dharmakīrti and Dignāga before him, "consciousness does not apprehend external objects directly but only through the mediation of aspects." Dreyfus notes, "An aspect is the reflection or mark of the object in consciousness. Our sense consciousness does not directly perceive a red color but captures the form of the object which leaves its imprint on consciousness. The aspect is the form of the object stamped on cognition that allows to differentiate among our experiences" (Dreyfus 1997:336). He continues, "To be aware of an object means to have a mental state that has the form of this object and is cognizant of this form. The aspect is the form or epistemic factor that allows us to distinguish mental episodes. Without aspects we could not distinguish, for instance, a perception of blue from a perception of yellow. Thus, the role of the aspect is crucial in Dharmakīrti's system, for it explains the nature of consciousness. Consciousness is not the bare seeing that the realist and common-sense imagine but the apprehension of an aspect, which stands for an external object in the field of consciousness"[276] (Dreyfus 1997:336). Dharmakīrti minimally explains the relation between the aspects and the external objects that caused them. He uses karmic traces (*vāsanā*[277]) to describe the

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[276] This is why Dreyfus describes Dharmakīrti as a representationalist (Dreyfus 1997:336). Although later Dreyfus notes that Dharmakīrti shifts to phenomenalist perspectives when he shifts to a Yogācāra framework (see for instance Dreyfus 1997:337).

[277] བག་ཆགས།

relation insomuch that there is an interactivity with what exists and what we perceive.[278] Dharmakīrti's perception "has access to external objects only via the mediation of directly apprehended objects, the aspects" (Dreyfus 1997:337); and in this sense, Tibetan medical pedagogy teaches one to see through the employment of these aspects. Again, these aspects are the perceptual characteristics of the *nyépa* that show up in the diagnostic objects of pulse, urine, tongue and so forth. 'Roughness' will have a perceptual characteristic in pulse, on tongue, and in urine for a given *rlung* disorder. In a sense, it is a naturalist's perspective on engaging with the world, teaching one to see by training in aspects, the only accessible content to perception in creating valid cognitions.

In the same way, Gen Namlhakhar, in the Tibetan medical hospital where I completed my internship and with whom I apprenticed for a rotation, consistently described pulses in terms of the aspects delineated in the *Four Medical Transmissions*. For example, he noted how the hollow and floating tactile quality of the pulse relates to

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[278] Prueitt notes that Dharmakīrti "relies on the idea that karmic traces (*vāsanā*, བག་ཆགས།) underlie two remarkable abilities of sentient beings: the ability to judge unique, momentary particulars to be the same as previously experienced objects and the ability to act as though the internally-formed concept that is the result of this judgment is a causally efficacious external particular" (Prueitt 2016:138). Dharmakīrti does not, however, give a detailed account of his understanding of what vāsanās are or the overall model of mind and world that they presuppose even though they are invested with explanatory significance. This is the tracking project, I argue, in which Tibetan medicine is invested in order to treat sentient beings of imbalance and disease produced by these vāsanās. Prueitt highlights a number of critiques, both medieval and contemporary, of "Dharmakīrti's ability to actually account for the nature of human experience in the conventional world given an ontology that denies the existence of universals" (2016:138). Prueitt highlights two levels of vāsanās used by Dharmakīrti: one, the formation and content of the particular experiences of certain types of sentient beings within certain types of worlds; and two, basic structures of samsaric experience that are common to all sentient beings (2016:138). The first level accounts for human variation and the biological similarities and disease patterns among distinct populations, as well as individual uniqueness and experience of health and disease within populations. The second accounts for similar experiences of health and illness across all beings, such that human biologies have certain similarities that are universally experienced given the similar structure of the life system in which they are situated.

its definitional aspects of being ‘light,’ ‘mobile,’ and ‘subtle’ as well as having a hard edge from its ‘roughness.’[279]

When I used other descriptions that seemed more elaborate in their depiction of what I was perceiving, such as ‘bubble-like’ and ‘erratic’, he continually re-directed me to the metaphors used by the text. This has a two-fold practicality: it retains the quality of perception as distinct from language, but provides direct links to the perceptual aspects that each person encounters providing perceptual data that can be deciphered through inference. Likewise, it protects the conceptual descriptions from moving beyond the simple aspects and reifying conceptual constructs of the perceptual data and the consequent inferences we must make from those data.

Subjective factors also influence one’s experience. Dharmakīrti specifies that some conditions will come to the fore based on differences “in terms of proximity, salience, and so on, just like how, having seen one’s father approaching, even though there is no difference between his being a teacher and his being a progenitor and so on, [one thinks] ‘My father is coming!,’ not that a teacher [is coming].” (as quoted in Prueitt 2016:124). This is why personal connection to content heightens memory of that concept and primes one to have greater perceptual acuity and vividness. In the Tibetan medical context, the memorization and recitation of the *Four Medical Transmissions* primes the mind with “learned concepts in appropriate ways.” It cultivates an awareness of specific aspects to attend to in perceptual experiences to gain more practicality of the perceptual

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[279] The classic definition for *rlung* is “rough and light, cold, subtle yet hard, and mobile.” རླུང་གི་མཚན་ཉིད་རྩུབ་ཞིང་ཡང་བ་དང་། གྲང་ཞིང་ཕྲ་ལ་སྙིང་གཡོ་བ་ཡིན། (TII, Ch 5:60).

moments and apply them to differential diagnostics and meanings of balance and imbalance of these principles for one's and others' well-being, and for those inclined, to be able to seek greater spiritual development.

The mental images that manifest through particulars are apprehended as "the same" because of the applied conceptual universal that allows them to appear in terms of an exclusion from other things. Interestingly, Dharmakīrti moves on to explain how such conceptual awarenesses may be nonetheless trustworthy. Dharmakīrti describes, "All of these and other such conventions are erroneous (*viplava*) in that they are constructed through the imprints left by experiences of particulars. Thus, conceptual cognitions whose production is connected to those real things by way of imprints are trustworthy with regard to a real thing, even though the real thing in question does not appear in those conceptual cognitions" (Prueitt 2016:125).

Before describing the conceptual-perceptual dialectic underlying Tibetan medical diagnostic training, I will turn to describing Dharmakīrti's epistemology in more detail.

Dharmakīrti's epistemology

Generally, from the greater Indic context, *pramāṇa* theory characterizes four parts in the production of knowledge: the agent who knows (*pramāṭr*[280]), the action of knowing (*pramiti* or *pramā*[281]), the object known (*prameya*[282]), and the instrument used to acquire

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[280] ཚད་མའི་བྱེད་ཤེས་བྱ་འཇལ་བ།

[281] གཞལ་བྱེད། རྟོགས་པར་བྱ་བ།

[282] གཞལ་བྱ།

that knowledge (*pramāṇa*[283]) (Dunne 2004:18). Thus, every knowledge event requires this architecture. This is in critical distinction to the Euroamerican conception of knowledge as accessing a set of conditions to form a conviction, belief, skill or attitude. In the *pramāṇa* model, the "action of knowing" is "a cognitive event occurring in a particular person's mind within a particular set of circumstances" (Dunne 2004:18). The relationship between body and mind is also clear: if the sensory organs are impaired, the perceptions will also be impaired. If someone has jaundice or ocular floaters, as the tradition describes, they may see conch shells as yellow and water-jugs as covered by hair. In the Tibetan medical context, a physician's fingers hardened by calluses would not be able to feel the pulse appropriately. A blind physician could not see important perceptual content of urine. Impaired tastebuds on a physician's tongue could not assess taste composition, and thus proper medicinal content of a formula, and so forth. Likewise, if a person has intense emotions like anger or lust, such emotions will distort their mind such that all cognitions occurring with those emotions, including the actions produced by those cognitions, are necessarily distorted. The focus here is understanding the process of producing mental events. A physician's mind, likewise, must have both stability and clarity for diagnostic purpose.

Pramāṇa theorists focus on the instrument, the means of producing knowledge as primary. As Dunne describes in the analogy of a person cutting a tree with an axe, the person and tree can only be identified as "cutter" and "cut object" through the means of the cutting instrument — the axe (2004:20). If the agent were another person using

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283 ཚད་མ།

another kind of instrument, perhaps a measurer and a measuring stick, then they all take on a different character of action and result. However, an axe on a different object still retains the action of cutting (*ibid*). In the Tibetan medical context, the type of instrument used for diagnostics determines what kind of perception one can gain. For example, pulse analysis relies upon the haptic faculty as an instrument. If one tried to assess the qualities of a pulse through observation, there would be a different kind of perceptual data one would retrieve, and consequently, less useful for the purpose of differential diagnosis. Tactile perception is a much better instrument for assessing the qualities of a pulse. On the other hand, trying to assess the qualities of urine by tactile perception would also result in a paucity of diagnostically relevant data compared to the visual faculty. So Tibetan diagnostics classifies these two diagnostic objects—urine and pulse—according to the diagnostic instrument that provides the richest means of trustworthy knowledge—observation and touch, respectively—-given the purpose of applying effective treatment. This understanding of gaining knowledge matters centrally for Tibetan medicine because the agent and instrument in Tibetan medical diagnostics is the physician him- or herself, and the quality or clarity of the instrument as well as the quality or clarity of the agent (in this case, in a cognitive embodied sense) plays an integral role in the reliability of the diagnostic result, that is the trustworthy cognition. The awareness of an object that one is able to gain depends intrinsically on the instrument employed.

This collapse of agent, instrument, and cognition represents a unique subset of ideas among *pramāṇa* theorists only adduced among Buddhist philosophers and namely promulgated by Dignāga and Dharmakīrti (Dunne 2004:21). It is also particularly

relevant to the Tibetan medical context because the physician (agent) is the embodied diagnostic instrument vis-à-vis the embodied cognition she gains through engagement with the object.

A direct perception[284] contacts a particular. Again, a "particular" is a momentary, utterly unique, and ultimately real entity (Prueitt 2016:35). It allows for a vividness and physiological affect that is always unique, momentary, and physically felt—an embodied cognition. Applying Dharmakīrti's theory of direct perception of a particular to a diagnostic context would look like the following: after one first conceptualizes the patterns associated with a given *rlung* pulse—that it has a floating quality, disappears upon applied pressure, and irregularly halts in beat—one then allows direct perception to arise in recognizing that that specific pulse manifestation is not part of or identical with the illness it represents. That is, the pulse signature does not have such meaning inherent in itself, but arises from the particularity of a given imbalance's interaction with the physiology that creates the pulse at one time. Moreover, the pulse has certain aspects that are being perceived. These are objective qualities of the object that perception cognizes.[285] This initial experience in perceiving the pulse in this way is called a "direct perception," that which occurs before a perceptual judgment arises. Once such a judgment arises, conceptualization is again in place. However, the initial direct

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[284] མངོན་སུམ། Although Dharmakīrti himself does not make a distinction between perception and direct perception, I use direct perception to emphasize the quality of vividness and nonconceptuality that Dharmakīrti intends.

[285] This is where the Geluk and Sakya accounts differ considerably (see Dreyfus 1997 for a full account). Geluks see the objective aspect as perception itself (Dreyfus 1997:408); whereas Sakyas see two parts to perception — an objective and subjective aspect. The objective aspect that perception cognizes (Dreyfus 1997:408), which is a representation of the object. Then there is the subjective aspect which is the apprehension of the appearance of the objective aspect (Dreyfus 1997:401).

perception allows for the perceptible content to be traced with more acuity and detail into the extensive sequence of physiological, environmental and social interactions that caused the imbalance with the particularity with which it was generated.

Furthermore, in order for perceptions to be acted upon, they must be conceptualized. That is, one must make an inference drawn from available perceptual content in order to achieve one's aims. There is an activation of the perception whose object has certain capacities. Thus, one needs to establish the trustworthiness of such a cognitive judgement. Inferential knowledge is the second basic instrument of knowledge important to *pramāṇa* theorists because of its role in investigating things that are hidden from perception as well as drawing certain conclusions based on perceptual information.[286] In this context, Dunne describes "an inference produces or constitutes a knowledge-event that knows its object by means of knowledge about another object that is invariably related to that object" (2004:25). The classic example is that an inferential cognition knows that fire is present by means of the perceptual knowledge of smoke which is invariably related to it. This classic example is also used explicitly in the first chapter presenting the mechanics of diagnosis in the *Explanatory Transmission*: "In learning diagnostics, just as with fire and smoke, an illness is recognized through its signs"[287] (TII, Ch24: 164). This reference further emphasizes the direct connection between *pramāṇa* theory and diagnostics in Tibetan medicine.

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[286] Inference also plays a role in understanding language. South Asian philosophers see language as a key aspect in "supplanting false beliefs of indubitable knowledge" (Dunne 2004:25), providing a framework to dispute these perspectives and give greater understanding of the theory and its applications.

[287] དོན་བརྒྱད་རྟགས་ལབས་པ་ནི། མེ་དང་དུ་བ་ཇི་བཞིན་དུ། ནད་ཀྱི་དོས་ནི་རྟགས་ལབརྒྱད། (TII, Ch24: 164)

Because perception is a direct experience of an object, it is the only means by which one may reliably gain direct knowledge of an object. It is without error, whereas inference is a distorted cognition even though it is valid. One must have experience of the causal relations between the objective aspects one perceives and the causal relationships in which it is embedded. In order to falsify the claims of inference, one still relies on gaining a valid cognition through perception of an object and inferring the causal trajectory. Perception remains primary in the hierarchy of valid evidence. This is particularly important in Tibetan medical training when the perceptual cues and their consequent causal relationships that the *Four Medical Transmissions* describes must be validated by perceptual experience. One cannot diagnose without engaging in proper employment of the means of perception. Dunne supports this claim by noting, "The relation in question must have its final appeal in sense perception itself" (2004:32)[288].

Furthermore, one must validate such knowledge by engaging it for a certain function. Dunne describes this as an "activation of a perception" in his translation of *pramāṇa* theorist Devendrabuddhi's explanation of how one goes about confirming a perception. Devendrabuddhi uses an example to explain:

> For the person who, having cognized a fire through perception, then acts (*'jug pa*) on fire's capacity to burn, cook, and so on, there is the activation of a perception whose object is the sensation of warmth and such. Or, for example, on certain occasions there might be a cognitive error due to something which has a form similar to fire and so on; at that time, there is for that person the activation of an inference through smoke which definitely determines fire. […] Because

[288] This is particularly important in inference-for-self and inference-for-others distinctions that Pramāṇa Theorists make.

> various causes of error are possible in the case only of perception, it is known to be instrumental through the activation of a subsequent instrumental cognition that has as its object that thing's (*artha*) telic function… (Dunne 2004:288).

For Tibetan medicine, one validates certain perceptions by determining their capacity to predict pathophysiology and therapeutic interventions. Such validation also occurs with inferences based on perceptual awareness — one must activate or put the knowledge to use to see its reliability. The development of the physician as diagnostic tool is cultivating vivid direct perceptions and validating inferences made in the text via clinical encounters and personal experience.

Conceptual-perceptual dialectic: generating embodied knowledge

Apoha theory allows for a process in which one moves back and forth between perception and inference to build a more resilient trustworthy understanding of a conventional world. Dharmakīrti's view of perception is that perception itself is always devoid of conceptuality (Dunne 2006:87). However, in order to make use of perception as a trustworthy awareness and use it for diagnostically-relevant judgments in directing efficacious treatments, one needs to have a system of reliably moving from perception to inference to judgment in a trusthworthy conceptual framework.

Likewise, one needs a method to use practically efficient concepts to "prime" the senses to make full and vivid perceptions in order to transmit that data back into the conceptual framework. I call this the "conceptual-perceptual dialectic" as a term to describe how Dharmakīrti's *pramāṇa* theory applies to the conventional Tibetan medical

context in training one's senses for diagnostic purposes. Dharmakīrti uses karmic imprints[289] and habituation to describe this process. Habituation allows one to make a correct judgment about a perception to guide one's action without requiring confirmation (Dunne 2004:290-2).

Initially, in such a process, there is the engagement with the perceptual data: the infinite array of particulars of the patient with which the sensory consciousness of the physician makes contact. Then there is the process of *apoha*, excluding all that is not the subset of particulars from which a mental "image" (*ākāra*[290]) appears based on a given purpose for selecting those particulars. The mental event of the image appears before a judgement or interpretation of the diagnostically relevant characteristics. As Dunne notes, "For Dharmakīrti, a perception is a source of accurate knowledge about the sensory object because the perceptual cognition's image of the object corresponds to the object" (Dunne 2006:84). Thus the image may be said to have "the form of the object" (*artharūpa*), and thus a "similarity" (*sādṛśya*[291]) to that object (*ibid*). From the mental event of the image, the judgment or interpretation comprises the next mental event and would qualify as content in explicit memory. Here, we see that for Dharmakīrti, implicit memories always precede and underlie explicit memories. Here I mean that there is a perceptual experience that one draws upon in recollection before the judgement of what that memory depicts (in terms of episodic and semantic descriptions). Thus, for

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[289] བག་ཆགས།

[290] རྣམ་བ།

[291] འདྲ་བ།

Tibetan medicine, the aspects that cognition identifies and temporally tracks—also translated as "images"—arise from perceptual data[292].

Furthermore, Dharmakīrti denies that the cause of perception need be external (Dunne 2006:85 fn51). So in the case of the Tibetan medical text evoking images through the rich use of metaphor, we can see the work of a trustworthy awareness in perceiving those mental images. Although such mental images may not be rich in full detail as they would be when engaging with an external object, the interplay between evoked mental images from the text and the engagement with the particulars of the patient catalyze the cognition to gain greater clarity in both perceptions of the actual external images as well as those invoked by the text: it is a deepening and layering through experience and realization.

For example, the urinalysis chapter states, "The bubbles of *rlung* are blue and large; those of *tripa* are subtle, yellow and quickly dissipate; and those of *béken* [arise in] saliva-like [forms]"[293] (TIV, Ch 2: 227). I recited these lines many times with clear visualized images in my head of what each urine looks like. I could see the bubbles popping quickly for yellow *tripa* urine, and steady and slimy saliva for *béken*. I could see large blue-colored bubbles for the *rlung* urine. However, it was not until Gen Khenrab showed us several example bottles of urine in our urinalysis class that we collected from each other, that the subtleties became clear. The *rlung* bubbles did not really look 'blue' in reality to me, but had a lighter distinct color. The *béken* bubbles formed a foam-like

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[292] That is, the རྣམ་པ། directs the སྣང་བ། that can arise.

[293] ལུང་སྟོད་ལ་ཆེ་བ་རླུང་ཡིན་ཏེ། ཁྲ་སེར་ཤང་པ་སྐྱེན་ན་མཁྲིས་པ་ཡིན། ལུང་མཆིལ་མ་འདྲ་བད་ཀན་ཡིན། (TIV, Ch 2: 227)

bubble mass on the top of the urine that held steady for up to a minute—much longer than I had visualized. The *tripa* bubbles were also small but dissipated rapidly — much more dramatically than I expected. “This would be a cause for concern,” Gen Khenrab said, regarding the instantaneously disappearing bubbles in one urine sample. “Whose urine is this?” he asked the class. No one raised their hand. I imagined they might see Amchi Khenrab later for a private consultation.

In Dharmakīrti’s system, mental images are also composed of particulars that are cauJenny efficacious and can provide grounds for experience and insight into the nature of reality. *Ākāra*[294] is the aspect of the object in consciousness as well as the aspected consciousness itself (Dreyfus 1997:339). It is both form[295] and quality[296] — the form through which the object is perceived. There is the objective aspect (*grāhyākāra*[297]) and the subjective aspect (*grāhakākāra*[298]); and all mental states consist of both (Dreyfus 1997:339). Since Dharmakīrti acknowledges that universals (that is, conceptuality) may be useful to guide one toward particulars, they are granted a “type of provisional existence” (Dunne 2006:144). By assuming the provisional existence, “one can employ conceptual cognitions—especially inferences—to accomplish one’s goals” (Dunne

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[294] རྣམ་པ།

[295] སྣང་བ།

[296] རྣམ་པ།

[297] བཟུང་རྣམ།

[298] འཛིན་རྣམ།

2006:144).[299] The rigorous practice of memorizing and reciting the text encodes these perceptual experiences—the aspects—in the sensory manifold of the physician, a process of deep embodiment through the perceptual-conceptual dialectic with the aim of relieving physical and mental distress of the patient, and ultimately to facilitate the patient's mundane and supramundane activities.

Dharmakīrti notes that on the basis of the same kind of perceptual content, a person with correct mental conditioning would not err in making a trustworthy awareness. For example, a familiarity with both mirages and water would allow a person to not mistake a mirage for water (Dunne 2006:88). The experience with both mirages and water may stem from each time one sees a mirage, one does not receive the practical use of water, in clenching thirst, bathing, and so forth, and so one recognizes the perceptual details that differentiate a mirage from water, or one can verify such knowledge through practically engaging the object. Thus, over time, one would be able to reliably distinguish mirages and water merely by sight. In this example, we see the fine discernment necessary to differentiate between seemingly similar phenomenal forms. In Tibetan medicine, this ability requires a depth of time and experience in fusing textual learning with clinical experience.

A similar constraint of telic and causal efficacy occurs in pulse reading in Western medicine. If the ontology does not allow for one to know more than heart rate from a pulse, then one will not apply a more sensitive instrument to assessing more qualities

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[299] Dharmakīrti is most concerned with the spiritual goal of liberation (*mokṣa*), and because Tibetan medicine is integrated into the ultimate aim of liberation from suffering—particularly creating greater balance in the physical and psychological realms to facilitate activities seeking spiritual achievement—the telic functions are synonymous.

than beats per minute for the pulse to determine tachycardia, bradycardia, or arrhythmias. However, if the ontology allows for greater information to be gained from a pulse reading, then the cognitive instrument assessing that pulse will be applied in such a way to gain greater detail. The qualities assessed of a pulse can be innumerable—a weak versus steep climb, taut versus slack, rough versus smooth, variable versus consistent, thick versus thin, rapid versus slow, abrupt versus gradual decline, thready versus collected, expansive versus contracted, variation in the areas under each half of index, middle, and ring fingers taking the pulses, and so forth.

Both the epistemological and ontological aspects of error (*bhrānti*) are psychologically indispensable for one to employ inference effectively in the pursuit of one's aim (Dunne 2006:313) — in this case, treating the illness and establishing health. The utility of inference makes them instrumental as cognitions, yet they still must be characterized by "falsity" (*mithyātva*) (Dunne 2006:313). Conceptual cognitions — specifically, inferences — are trustworthy because they reliably enable us to achieve our goal (Dunne 2006:314). An inference is based on evidence perceived by someone who makes the inference (Dreyfus 1997:306). Thus, there is an aspect of perception to the inferential cognition (Dreyfus 1997:317). The link between inference and reality is provided by the cognitions that apprehend the evidence and are technically described as apprehensions of the evidence[300] (Dreyfus 1997:534 fn5).

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[300] རྟགས་འཛིན་སེམས།

Teleology and purpose: why know?

For *pramāṇa* theorists generally and Dharmakīrti specifically, the idea of purpose (*prayojana*) is important in "forming the context within which an instrumental object is known" (Dunne 2004:45). Although this may seem contrary to how many Euroamerican thinkers view how knowledge is obtained, it is very familiar to an anthropological paradigm[301]. In fact, anthropology specializes in context—meaning making is based upon the context in which it is embedded. One would not ask a question about consciousness, for example, if a given cultural context assumed its absence. One would not look for how mind changes the body if it were assumed that mind cannot change the body. In fact, the persistence of this latter view inhibited the development of the psychoneuroimmunology field in Western science. One develops certain instruments to observe certain phenomena.

Purpose is seen as "a *necessary* component in the process of knowing" (italics original; Dunne 2004:45). In the Tibetan medical context, the purpose to heal and to benefit beings in their attainment of greater lasting happiness *shapes* the knowledge one may obtain from the context. This shapes the kind of knowledge that can be known. As Dunne describes, "It is with some purpose in mind that one seeks to act in a manner informed by the indubitable knowledge than an instrument of knowledge

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[301] Even in the early 1900s, Ruth Benedict spoke of how context patterns cultural processes — details of behavior are understood through the background of motives, emotions, values, social relations, ecological relations and so forth (Benedict 1934). Even the meaning of illness has different understandings depending on context. In American society, it can be understood as the intrusion of certain microorganisms: bacteria, viruses, protozoa. In the Tibetan medical context, it is seen as a much broader trajectory arising from nascent patterns in the mental faculty that interact with early psychophysiological imprints and current conditions. On a more superficial level, it can even be seen as the exacerbating condition of *rlung* flaring any initial condition such as a slight overpopulation of a parasite, or a weakness in neural signaling, or a genetic disposition for a given hereditary condition.

provides" (2004:46). Dunne quotes Uddyotakara, one of Dharmakīrti's opponents, in his clarification of what one is apprehending:

> What is one apprehending? One is apprehending the causes (*sādhana*) of happiness and suffering. That is, having understood, "This is happiness," one then strives so as to obtain happiness. And having understood, "This is the cause of suffering," one acts so as to eliminate suffering. People are motivated (*prayujyate*) by the attainment of happiness and the elimination of suffering. Hence, their purpose is the attainment of happiness and the elimination of suffering. (2004: 46)

In Tibetan medicine, investigating these causes for the purpose of uncovering the interdependent relationships that promote well-being in the body and relieve suffering, pain, and distress necessitates the kind of knowledge Tibetan medicine gains about the nature and identity of these causes. The purpose requires that the causes be psychological, physical, phenomenological, environmental, social, and so forth. The purpose shapes the kind of information that one can gain from the context in which one looks.

This may seem a subtle or trivial point, but it has significant consequences. Many patients come to me describing experiences with Western doctors who told them that they should stop worrying about their chronic pain because "there is nothing physically wrong" to cause them pain. However, in Tibetan medicine, even the continual experience of distress from chronic pain is a context that needs investigating as to sources of pain — be they physical, psychological or both. The purpose of relieving distress on all levels means that the objects of knowledge one seeks to uncover are exposed by the very purpose one has in uncovering them, namely to relieve the suffering.

In Western medicine, the purpose is to correlate patient experience with known physiology and pathology. If the purpose is not to relieve distress and suffering, the doctor will not look further than the known physiology and pathology. Thus, the purpose —to understand the physiological mechanism to trace disease and align it with published peer-reviewed experimental evidence to determine treatment course—constrains the evidence one seeks for the patient phenomenology of pain. Since pain has innumerable modulating factors, many of which are poorly understood, the evidence one seeks may be limited. Likewise, if the ultimate goal is to promote greater sustained contentment, well-being, and happiness, and eliminate experiences of suffering, one consequently looks for the causes which facilitate the former and dispel the latter. One becomes habituated to the etiology facilitating experiences of well-being and the etiology that brings on experiences of distress and suffering.

Although an opponent to Dharmakīrti, in line with general *pramāṇa* theory, Uddyotakara states, "Purpose is the *primary* contributing factor (*pradhānāṅga*) for the process of investigation (*parikṣāvidhi*), because the process of investigation is rooted in the purpose that it serves" (Dunne 2004:47). This allows for certain instruments of knowledge, in the context of a purpose, to result in evidence which provides a "determinate cognition"[302] that claims a proposition such as, "This is a cause of happiness" (Dunne 2004:47). This lays part of the epistemological groundwork for how Tibetan medicine may implicate a *cause* compared to a *condition* to facilitate the development of a result. A further implication, as Dunne summarizes, is that "if a person

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[302] དེས་འཛིས།

does not have a purpose in gaining knowledge of some object or context, then even if that object is available to some instrument of knowledge, she will not cognize it precisely because she has no reason to do so: she lacks the purpose or motivation that is a necessary factor in the knowing process" (2004:47). For example, if one does not have the purpose to hunt an animal for sustenance, then one may not even notice an animal's tracks when one walks into the forest. The perceptual information does not present to the cognition because the cognition does not have a purpose from which to perceive it. Furthermore, even having recognized that the impressions on the ground are a set of animal tracks, one may not be able to apprehend the detail in the tracks that indicate which animal made the tracks, when the tracks were made, how fast the animal was moving, if the gait and timing was normal or abnormal for this animal, how old the animal is, if the animal is healthy or ill, panicked or comfortable, if the animal has a full or empty gut, if the animal is male or female, and so on because that information is not relevant to the perceiver, and those details do not fulfill a purpose in the act of perceiving. All these pieces of information in the object of the track are there for apprehending, but may not be apprehended or even perceived if a person does not have the purpose or need to do so.

In Western medicine, the lack of an explicit integration between the purpose that one is procuring knowledge about a patient and the inherent purpose with which one is procuring that knowledge may be a major factor in compassion deterioration the more years one is in medical school instead of the contrary. However, despite limited studies on pain causation, many Western doctors seek to provide their patients with experiences of

wellness and minimize suffering. Therefore, they are willing to look beyond available published evidence and investigate further causes, refer patients to other alternative modalities of treatment and so forth. There is an openness and curiosity driven by the purpose to support patient health and well-being. In Tibetan medicine, it is expected that the greater compassion one develops — that is, the clearer one is about one's purpose in relieving the suffering of one's patient — the more information one can procure about the causes leading to that patient's suffering, and hence the greater the efficacy in care.

Thus, efficacy is also tied to teleology in that the "accomplishment" (*kriyā*) of a "goal" (*artha*) is determined by the role that purpose takes in determining what constitutes an instrument of knowledge and what action it incites from apprehending that knowledge (Dunne 2004:48). Dharmakīrti places great emphasis on the purposes and goals in the process of knowing (*ibid*:49). In Tibetan medicine, maintaining health, treating illness and misery and extending life is in the service of a greater goal: the realization of ultimate reality and the benefit of all beings—and the required time and effort it takes to achieve such an aim. Thus, all intervention is aimed at facilitating the conditions for the achievement of this greater goal. Of course, although many within Tibetan society do not arrive at the doctor's clinic with this explicit aspiration in mind, the goal is part of the context for living a long life and having good health enough to work toward this goal. The goal is not an epitome of health itself. It is a healthy enough body so that one can pursue one's aspirations. This is also a major difference between the Western and Tibetan medical frameworks. This teleology of enlightenment provides the conceptual frame for all to understand their ultimate aspiration — for example, in a better

rebirth to gain greater ground toward this goal — and in which many activities, work and social engagements are framed.

Causality

Before moving on to how this model applies to diagnostic theory as described in the *Four Medical Transmissions,* it is important to reflect on the view of causality in this model and as applied in Tibetan medicine. When describing the acting, or efficient, cause[303] as enumerated in the *Abhidharmakośa*, it should be substantially distinct from the produced entity, and it should be consistent with producing the entity and not obstructing the entity's production, such as the clay used to make a pot.[304] It also describes various types of conditions, such as the causal condition, observed condition, dominant condition, and ensuing condition[305], that are the proximal conditions generating the effect. Similarly, Tibetan medicine draws on these theoretical frameworks for cause and condition.

> *Every illness has a cause from which conditions allow it to manifest*
>
> *Without the inciting conditions, a result cannot arise from its cause*
>
> *Thus, one should abstain from the inciting conditions for all illnesses.*[306] (TII, Ch 23:161)

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[303] བྱེད་རྒྱུ།

[304] གྲིར་བྱེད་རྒྱུའི་མཚན་ཉིད་མེད་ཅང་གཞི་ལ་སྣང་བ། བྱམ་པའི་བྱེད་རྒྱུའི་མཚན་ཉིད་ནི། བྱམ་པ་དང་རྫས་ཐ་དད་ཡིན་པ་གང་ཞེག་བྱམ་པ་སྐྱེ་བ་མེགས་མི་བྱེད་པ་ཡང་ཡིན་པའི་གཞི་མཐུན་པ། བྱམ་པའི་བྱེད་རྒྱུའི་མཚན་ཉིད་ནི། བྱམ་པ་བཟོ་བྱེད་ཀྱི་འཇིམ་པ་ཉ་བུའོ། (Jamphel Drakpa 2008:75)

[305] རྒྱུ་རྐྱེན། དམིགས་རྐྱེན། བདག་རྐྱེན། དེ་མ་ཐག་རྐྱེན། (Jamphel Drakpa 2008:77)

[306] །འདི་ཀུན་རྒྱུ་ལས་རྐྱེན་ཕྱིས་བསྟུང་ལས་འབྱུང་། །རྐྱེན་མེད་རྒྱུ་ལས་འཕས་བྱ་འབྱུང་མི་སྲིད། །དེ་ཕྱིར་ནད་རྣམས་ཀུན་ཀྱི་རྐྱེན་སྤང་བྱ། (TII, Ch 23:161)

The ultimate cause in Tibetan medicine is seen as a seed with many potential outcomes. It does not grow or come into fruition without the influence of conditions. Every cause is embedded in a vast field of conditions. Conditions nurture the causal seed to ripen into its results — in the Tibetan medical case, disease.

In many ways, the concept of "condition" and "cause" in Tibetan medicine is opposite to how such terms are used in the Western paradigm. "Cause" (*gyü*[307]) in Tibetan medicine is the causal basis for an effect to occur[308]; "condition" (*kyen*[309]) is the contributory or more proximal causes that facilitate the effect to take place. It is the accompanying cause that "ripens" (*minpa*[310]) the effect; it specifically develops the effect[311]. The state of a person's immune system due to their distressed mental state would be considered a "condition" in Western medicine; whereas the pathogen that took hold to initiate the disease would be considered the cause. The opposite is the case in Tibetan medicine: the pathogen would be considered the proximal or contributory cause (the "condition," *kyen*) and the distressed mental state that led to a poor immune system function would be considered the primary cause (*gyü*).

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[307] རྒྱུ།

[308] དངོས་པོ་རྣམས་འབྲུང་བ་ལ་བབྱོས་བྱེད་ཅིང་སྟོན་དུ་འགྱོ་དགོས་པའི་ཆ་རྐྱེན་ཞིག། རྒྱུ་ནེད་འབས་བུ་འབྲུང་མི་ཡིད། རྒྱུ་ནེད་འབས་བུ་འབྲུང་མི་ཡིད་ཅེས་པ་ལྟ་བུ། (དཔལ་ཡིག་གསར་བསྒྲིགས།) (Sonam Tsering 1979). It is also "the seed or root that produces the essence of the effect" (རྒྱུ་ནི་འབྲས་བུའི་ངོ་བོ་སྐྱེད་བྱེད་ཀྱི་སས་བོན་ནམ་རྩ་བ། ཚོགས་མཛོད་ཆེན་མོ། Longchen Rabjam Drime Ozer (1308-1364), *The Comprehensive Dictionary*)).

[309] རྐྱེན།

[310] སྨིན་པར་བྱེད་པ།

[311] རྐྱེན་ནི་འབས་བུ་སྨིན་པར་བྱེད་པའི་བྱོགས་སུ་ཐུར་པའམ་འབས་བུའི་ཁུངས་པར་སྐྱེད་བྱེད། ཚོགས་མཛོད་ཆེན་མོ། Longchen Rabjam Drime Ozer (1308-1364), *The Comprehensive Dictionary*)

Cognitive scientist and linguist George Lakoff uses the term "systematic causation" in a way that approximates the Tibetan medical understanding of causation:

> Systemic causation is familiar. Smoking is a systemic cause of lung cancer. HIV is a systemic cause of AIDS. […] Sex without contraception is a systemic cause of unwanted pregnancies. There is a difference between systemic and direct causation. Punching someone in the nose is direct causation. Throwing a rock through a window is direct causation. Picking up a glass of water and taking a drink is direct causation. […] Any application of force to something or someone that always produces an immediate change to that thing or person is direct causation. When causation is direct, the word cause is unproblematic. (Lakoff 2012)

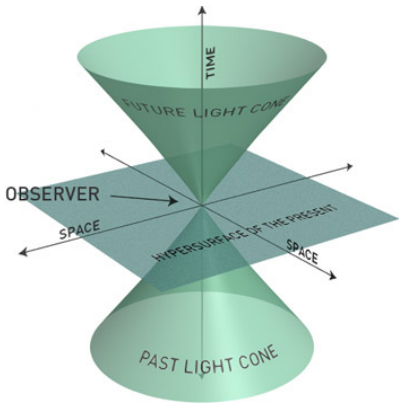
For Lakoff, systematic causation draws upon a multitude of causes, thus often alluding general understanding or observation of how it manifests. Systematic causation may require special contributing causes—what Tibetan medicine would call "conditions"—to facilitate the growth of a "causal seed." Lakoff describes it as a network effect that may be hidden under more direct causes, or be highly probabilistic under certain conditions. It may also result primarily from feedback mechanisms. Systematic causation is the principal mode of causation in ecosystems, economic systems, social systems and all biological systems. All natural systems function through systematic causation. It is less apparent than direct causation but critical to understand in order to characterize how natural systems function.

Tibetan medical and Buddhist philosophical thought would argue that Lakoff's account of "direct causation" would need reinterpretation as systemic causation because

the conditions that require a person or thing to enact a certain action are part of the causal chain, or in the Tibetan medical perspective, the web of conditions.

In classical Newtonian mechanics, a "cause" is represented as a force acting on a body, and the "effect" is the resultant acceleration. At this level of analysis, one could see that multiple force vectors could contribute to the summed resultant acceleration. However, this is not the view of cause and condition from the Tibetan medical perspective. In Tibetan medicine, the cause would be the potential energy to move, and the conditions would be the actual forces. This perspective is a juxtaposition of what we may interpret from the term "cause" in a classical mechanics perspective. Maxwell's electrodynamics and Einstein's general theory of relativity introduce dynamic field theories, where cause and effect must necessarily be mediated through the contiguity of space and time where the effect must necessarily be contiguous with the future light cone of its cause. This perspective resonates more strongly with the Tibetan medical perspective on causality because the cause is simply the condition that precedes the effect, and the conditions are the contributing factors that facilitate the contiguous space-time light cone toward the effect, or in this case the numerous possible effects depending on the interactive conditions.

Figure 2. Light cone demonstrating causality.



As in the figure, a possible cause, or event, exists at time = 0. As time progresses, the effects of the event can only spread across space and into time in the manner in which it is in contact with various other conditions or events. Thus, a given effect can only result from a given causal event, and can only manifest through time within its embedded causal relations.

Similar to Dharmakīrti's perspective on causality, one could draw greater similarity to the idea of distributed causality in chaos theory whereby "small variations of the initial condition of a nonlinear dynamical system may produce large variations in the long term behavior of the system" (Lorenz 1972). Here, the "initial condition" would be the "cause" in the Tibetan medical sense, and the "small variations" would be the inciting conditions which would lead to the "larger variations", which would be termed the "result" in the Tibetan medical terminology.

This is what Lorenz called "the butterfly effect" where the beat of a butterfly's wings in one part of the world could set off a tornado in another part of the world (Lorenz 1972). In the Newtonian system, similar to the descriptions of Dharmkīrti's *apoha* theory above, the only conditions taken into account are those that are "both necessary and sufficient." So when looking at a sphere rolling down a slope, one looks at it starting from a point of "unstable equilibrium" where the initial push to put it into motion is not addressed explicitly as a cause. The force of gravity accelerating the sphere is the primary

cause addressed. Tibetan medicine would look at the initial unstable equilibrium as the cause, and the conditions as the gravity causing the acceleration. Mackie (1980) argues that the way “cause" is usually referred to in fact refers to “INUS” conditions — that is, “insufficient but non-redundant parts of a condition which is itself unnecessary but sufficient for the occurrence of the effect.” This definition aligns more closely with the way Tibetan medicine understands conditions as well.

Chapter conclusion

From an appreciation of the ontology and epistemology within Tibetan medicine, one can now have a basis from which to understand the particular pedagogy used to transmit this system, and the methods privileged for such study. Medical diagnostics is a sub-set within the curriculum; however, it exemplifies fundamental aspects of the ontological and epistemological reality within which Tibetan doctors operate. The mind is understood to ride upon *rlung* in the body. Mind affects the pathways and function of *rlung* just as *rlung* affects the movements and events of mind. The interrelationship of mind and *rlung* demonstrates the inseparability of mind and body in Tibetan medicine—the ontological reality that mind affects body and body affects mind. This dynamic relationship will be key in later chapters when we look at symptomology, pulse, urine, *habitus* and constitutions.

Likewise, the epistemology of Tibetan medicine engages various levels of reality. In this paradigm, the physiology and pathology of the body, as well as the expectations of the doctor about the capacity of the patient are different. Though I do not engage these

various levels of analysis in this work, it is important to keep this perspective in mind so that the teleological perspective becomes clearer. As Leslie Blackhall states (2012), the aim in Tibetan medicine is not to extend life and maintain health just to live longer per se, it is to increase the amount of time that one can devote to pursuing greater happiness and a spiritual path toward enlightenment. It is an argument for living longer so that one has more time to use the rare opportunity of a human birth to gain greater realization, become more beneficial to others, and progress toward the ultimate aim of enlightenment. It is assumed this will also lead to greater wealth and happiness along the way as well, but the teleological context for physicians with their patients on a broader level is the continuous work in gaining merit and assisting in the advancement of spiritual development for each sentient being in this lifetime. Of course, the quotidian individual may be less concerned with spiritual development and merely seek relief of suffering and the support of good health; however, the cultural teleological context of what one *should* seek permeates the sociocultural context and frames how the aims of medical practice are understood and received.

A Tibetan medical epistemology arises from *pramāṇa* theory generally, and particularly, Dharmakīrti's approach. Since the physician is an embodied diagnostic tool, in order to establish valid evidence for differential diagnosis, one needs to know how to produce reliable data through direct perception and inference. Although we discussed Dharmakīrti's broader ontology, Tibetan medicine relies on a specific ontology of the body and ways things exist that is situated within the epistemology just presented. Our Buddhist logic class at SLL particularly fused these two realms of epistemology and

ontology at the level of the body and perception of the body. The Buddhist model of ontology, epistemology, and valid forms of cognition allows us to see the grounded theory that infuses Tibetan medical ideology on how one should train in perception and sensory acuity, and the body ontology itself. Dharmakīrti's theory of *pramāṇa* provides an analytic frame in which I focus on how the conceptual becomes the perceptual, and vice versa, and valid ways of knowing for such a context.

The next chapter will elaborate on the diagnostic theory in Tibetan medicine and demonstrate how memorization and recitation, and metaphor and clinical experience engage Dharmakīrti's *pramāṇa* theory to inculcate physician as embodied diagnostic tool. Then, the subsequent and final chapter, will show how such expertise in Tibetan medicine is conceived, and demonstrate the methods of training used to create expertise.

Chapter VI
Working Grounds in Producing Embodied Knowledge: Diagnostic theory & praxis

When senses perform and texts float in mid-air…

Having seen how Tibetan medical diagnostics work in a clinical setting, the pedagogical framework, and the perspectives from cognitive neuroscience and *pramāṇa* theory as to how the training mechanics should work, I now proceed to describe the textual foundations for diagnostic theory in the *Four Medical Transmissions* and several clinical examples from my internship and apprenticeships with mentors to distill key points from the theory: (1) a fabric of causal processes embodied in the patient that diagnosis engages, (2) diagnosis as process through time not single events, and (3) metaphors as complex data organizers which perceptual skill engages for diagnostic meaning. Tibetan medical diagnostic theory is the conceptual content that is drawn from and re-infused in the conceptual-perceptual dialectic of *pramāṇa* theory and the development of implicit and explicit forms of memory and experience that I described previously.

Theoretical foundations for diagnostics

Textually, we learn diagnosis in sections. At Men-Tsee-Khang (MTK), we learned the diagnosis chapter of the *Root Transmission* the first semester of our first year. Later in the first year at Men-Tsee-Khang, we studied the three chapters on diagnostic theory in the *Explanatory Transmission*, as well as the five pathology chapters of the *Explanatory*

Transmission, where various diagnostic details are also presented[312]. In the second and third years beginning the *Oral Instructions Transmission* proceeding through the fourth and fifth years in which we completed all sections of the *Oral Instructions Transmission,* we learned the diagnostics for each category of illness — *rlung*, *tripa*, *béken*, *béken mukpo*, hot illnesses, internal illnesses and so forth — along with two diagnosis-specific chapters in the hot illnesses compendium called "Boundary Between Mountain and Plain for Hot Illnesses"[313] and "Critical Treatise on Hot and Cold Illnesses."[314] During the same set of courses for the second year, we simultaneously began working our way through the fourth compendium of the *Four Medical Transmissions* called the *Subsequent Transmission* where there is a chapter dedicated each to pulse diagnosis and urinalysis. Thus, the theory for diagnosis at Men-Tsee-Khang is covered completely before any practical exposure is introduced. When I left for Amdo, we had covered most of the chapters specifically relevant to diagnosis at Men-Tsee-Khang except for the encyclopedia of illness-specific diagnostics in the third transmission compendium, which I continued at Sorig Loling (SLL).

At SLL, most diagnostic theory was covered in one course in the second year, taught by Vice Dean Samdrubgyal. He is also the editor of the textbook volume on diagnostics (Samdrubgyal 2010) that has been used by our school and all Tibetan medical

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[312] These are covered in seven sections: illness causes, conditions, entrances, locations, definitional characteristics, categories and significance of individual disorders. འཕེལ་འགྲིབ་ནད་ཀྱི་གནས་ལ་བསླབ་བྱ་ན། རྒྱུ་རྐྱེན་ཞུགས་ཚུལ་གནས་དང་མཚན་ཉིད་དང་། དབྱེ་བ་སོ་སོའི་དོན་དང་བདུན་དུ་བཤད། (TII, Ch 8:71)

[313] ཚ་བའི་ཐང་མཚམས།

[314] ཚ་གྲང་གལ་མདོ།

schools throughout Tibet for the last ten years. When I arrived in Xining, I was eager to take Samdrubgyal's class since he is known among students to be an excellent teacher, and I was curious how he might teach differently from my teachers at D'asa MTK. However, the Diagnostics course in Xining is part of the second year curriculum, and I was entering the third year curriculum. I had already completed the content that the diagnosis course would cover in my classes at D'asa Men-Tsee-Khang. However, because Samdrubgyal is known as an authority on diagnostics, I had all his classes recorded by a student in his class and I listened to the recordings when I returned to Emory.

I found his teaching style of diagnostics similar to that of my MTK teachers, except that he was much more focused on the practical employment of diagnostics, including record-keeping, relating general diagnostics to specific conditions throughout the *Oral Instructions* chapter and pointing out potential diagnostic challenges. I also found that SLL distinguished differences between Tibetan medical diagnostics and Western medical diagnostics more clearly. Likewise, similar to all our classes at SLL, the diagnostics course also integrated participant-observation in the Tibetan medical hospital such that SLL students gained clinical exposure on diagnostics earlier than those at MTK. Both MTK and SLL courses used in-class pulse and urine tutorials, drawing from samples brought by students in the class for the practicums.

The chart below details the diagnostic chapters in the *Four Medical Transmissions* by section.

Root Transmission	Explanatory Transmission	Oral Instruction Transmission	Subsequent Transmission
One chapter	Three chapters (diagnostic theory) + five chapters (pathology)	Diagnostics relevant to all 15 compendiums comprising 156 chapters, plus two diagnosis-specific chapters	Two chapters
• "Identifying the Signs." Pithy section on observation (urine and tongue), palpation (pulse), and inquiry with concise summaries of the diagnostics for rlung, tripa and béken	• "Diagnostics Based on the Actual Manifestation of the Nyépa" • "Diagnosis by Indirect Skillful Means" • "Analysis of the Four Possibilities of Acceptance or Rejection of a Patient" • "Illness cause" • "Conditions facilitating illness" • "Modes of entrance of illness" and "Locations of illness" • "Definitional characteristics of illnesses" • "Categories of illness" and "Individual significance of each disorder"	1. rLung, Tripa, Béken, and Béken Mukpo Disorders 2. Internal Illnesses 3. Hot Illnesses 4. Upper Body Illnesses 5. Vital & Vessel Organ Disorders 6. Genital Disorders 7. Miscellaneous Disorders 8. Coemergent Lesions 9. Pediatric Disorders 10. Female-related Disorders 11. Dön Disorders 12. Wounds & Traumatology 13. Toxins 14. Geriatrics 15. Infertility & Virility	• Discourse on pulse analysis: "Recognizing illness through touching the channels" • Discourse on urine analysis: "Recognizing by seeing into the mirror of urine"
		• "The Boundary Between Mountain and Plain for Hot Illnesses"	
		• "Vital Points on Hot and Cold Illnesses"	

At MTK, we learned diagnostic theory in the following chronological sequence: diagnostic chapters from *Root*, *Explanatory*, *Subsequent*, then *Oral Instruction Transmissions* (column 1, 2, 4, then 3, respectively). Separate instructors taught each group of chapters as separate classes. *Root, Explanatory,* and *Subsequent* Transmission

chapters were taught in the first three years, and chapters from the *Oral Instructions Transmission* were taught through the third, fourth and fifth years. At SLL, we learned the material in a similar sequence, but diagnostic chapters from *Explanatory* and *Subsequent Transmissions* (columns 2 and 4, respectively) were taught as an integrated class on diagnostic theory in our third year. At both MTK and SLL, the topics and diagnostics in column 4 were taught as individual classes as part of courses on each class of illnesses. See the Appendix for further details on the curricular progression at MTK and SLL.

Notably, embodied knowledge is assumed in Tibetan medical diagnostic theory. Each textual section on diagnostics explicitly articulates physiological cues that the amchi should notice, observe, feel, hear, smell, taste. These cues fall into the general categories of objects of observation, touch and inquiry discussed earlier for the condensed thirty stanza diagnosis *Root Transmission* chapter. These three modes of diagnostic means can apply to any object of observation, touch, or inquiry relevant to the patient's condition The *Root Transmission* chapter may seem to imply that observation applying focuses merely on the tongue and urine, and palpation on the pulse[315] because these are the only examples it provides. For example, observing the entire patient—their skin quality and complexion, eye sclera, movement, restrained functions, areas of tenderness and so forth are often equally important to observe. The diagnostic chapters in

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[315] The *Root Transmission* chapter on diagnosis introduces the three modes of gaining diagnostically relevant information — observation, palpation and inquiry. The chapter presents the tongue and urine as objects of observation, the pulse as an object of palpation, and inquiry in investigating the conditions that gave rise to the illness, the mode in which the illness presents itself (i.e., pathology and behavior of the disease), and dietary associations. The chapter proceeds to describe key differential diagnostics for each diagnostic mode that will identify if a disorder is manifested by a *rlung*, *tripa*, or *béken* imbalance.

the *Explanatory Transmission* clarify that diagnostically relevant information extends to any perceptual object that the amchi may engage. Urine and pulse are particularly important in distinguishing hot from cold illness and approaching death, respectively; however an amchi should attend to all relevant perceptual objects of diagnosis. Again, the *Root Transmission* provides a highly condensed, pithy version of the medical teachings. This is where Dharmakīrti's *pramāṇa* theory and explication of perceptual mechanics come in, both in the way perception works, and how one can rely on perception as a trustworthy means of gaining reliable diagnostically relevant information. If perceptual data obtained from one's sensory organs is not faulty and the sensory organs themselves are not damaged or otherwise unreliable, then one can rely on that information. In order to understand how the diagnostic theory applies, I will first go more in-depth on the view of the body and general content from the chapters on pathology. This will provide important details on which to apply the details from diagnostic theory.

View of the body and pathology

Rlung, *tripa* and *béken* form functional energy systems[316] in the body. When out of balance, they can also transform into pathogenic drivers. They constitute forms in the body, and thus, one can measure the amount of each *nyépa* that indicates its proper balanced state or transgression into imbalance. For example, the proper amount of *rlung* is equal to the size of the urinary bladder of that person. The proper amount of *tripa* is equal to the scrotum of that size person, including that equivalent amount for the

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[316] Also referred to as "dynamics" (Cuomo (year); Craig (year)).

respective body size of a male for females. And the proper amount of *béken* is three of that person's cupped hands. (TII, Ch 4). Blood and *chu-ser* function as fourth and fifth *nyépas* in many contexts of the *Four Medical Transmissions*. Likewise, the *nyépas* also function as bodily constituents in some ways. When describing proper amounts of each *nyépa* in the fourth chapter of the *Explanatory Transmission*, the *Four Medical Transmissions* present the content under the heading of the "basic state of the bodily constituent measurements." So here the *nyépa* also work like bodily constituents, approached as physical masses or constituents, whereas in other contexts they are engaged as functional energy systems and pathways with specific characteristics. Blood itself is one of the seven enumerated bodily constituents — nutritional essence, blood, muscle, fat, bone, bone marrow, and regenerative fluid.

When out of balance, *nyépa* become pathologic. The text distinguishes these latter two contexts of functional versus pathological *nyépa* by terming the former as the *nyépa* that have not undergone transformation in their characteristics[317] (TII, Ch 8). Each bodily constituent connecting to a *nyépa* also has a proper amount that the body maintains to support a healthy body. Likewise, the generation and maintenance of each bodily constituent, similarly for the *nyépa*, originates in the functional activity of the five element principals in the body as well as the micro-component *rlung*, *tripa* and *béken* in the bodily constituents. For example, *tripa* resides in the stomach organ, blood, perspiration, nutritional essence[318], *chu-ser*, eyes, skin, and between digested and

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[317] རྣམ་པར་མ་ཐྲུར་པའི་ཉེས་པ།

[318] དྭངས་མ།

undigested regions of the digestive system (TII, Ch 10). When any of these components are in excess, deficiency, or disturbed development or function, there is said to be imbalance, and disease results. Diagnosis in Tibetan medicine assesses the degree to which a *nyépa* or bodily constituent is in excess, deficiency or disruption. It looks at the conditions that may cause the generation or increase[319] of a *nyépa*, also known as the "progressive condition" (D'asa MTK trans); its accumulation and rising[320] above its proper amount, also known as the "accumulative manifesting condition" (ibid); and conditions causing it to manifest[321] into its fully symptomatic form (cf, TII, Ch 9), also known as its "actual arousal condition" (ibid). When the accumulation enters one of the six modes of entrance — impacting skin, spreading in muscle, traveling along channels, adhering to bone, transmitting into vital organs and falling into vessel organs[322] — disease ensues and the illness manifests[323]. Symptoms characteristically appear in the classic *nyépa* regions — for example, the hip sockets and joints for *rlung* (TII, Ch10:79).

In many ways, the typologies of causal conditions that act upon the constitution of the individual and transform functional *nyépa* into dysfunctional *nyépa* in Tibetan medicine is similar to the systems ecology perspective on child development in Worthman's bioecocultural model (2010). The model, as depicted below, describes mechanisms of embodiment through critical periods of development that shape the life

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[319] སྐྱེ་ཞིང་ཟཆེད་པར་བྱེད་པ་སྐྱེ་ཟཆེད་དང་།

[320] གཞོག་ཅིང་ཕྱད་བར་བྱེད་པས་གཞོག་ཕྱད་ཞེས།

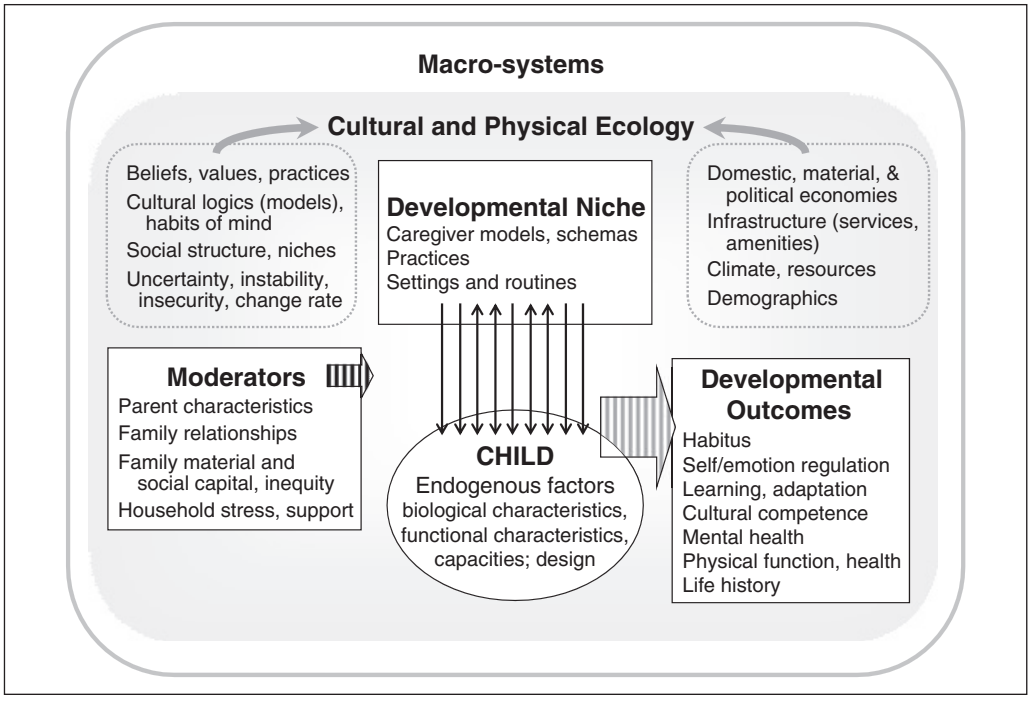
[321] བསགས་པ་སྟོང་བར་བྱེད་པ་སྟོང་ཆུན་ཡིན།

[322] པགས་ལ་གྲམ་ཞིང་ཁ་ལ་རྒྱས་པ་དང་། རྩ་རྒྱུན་ཞིང་རྒས་ལ་ཞེན་པ་དང་། དོན་ལ་འབབ་ཅིང་སྡོད་ཐུབ་བར་འགྱུར། (TI, Ch3: 23)

[323] ལས་དྲུག་ཞུགས་ནས་བའི་མེད་ནད་འབྱུང་འགྱུར། (TII, Ch 10:78)

course trajectory of health and disease. The cultural and physical ecology is shaped by the wider societal structure, demographics, geography and ecology, as well as the more proximal domestic conditions of material surroundings and conditions. Such a context is infused with the cultural models and habits of mind that arise from the society, and even more proximal, the moderators of parental and family relationships and behaviors. The child has a specific developmental niche shaped by these more distal and proximal social and physical ecologies that engage with the child's endogenous factors, which in the Tibetan medical context would comprise the psychophysical constitution, karma and consciousness of the child.

Figure 3. Diagram of bioecocultural model highlighting elements and pathways of embodiment in child development, and relevant to the life course. Source: Worthman 2010, as modified from Worthman 2003, 2009



These various conditions and influences lead to specific developmental outcomes of health outcomes, life history, physical and mental function and health, habitus, emotion

regulation, learning and adaptation capacities and so forth. These latter outcomes are the specific aspects of health and wellness that Tibetan medicine tracks through its diagnostics. The diagnostics identify perceptual cues as marking aspects of health and disease linked to these developmental, acute, and chronic pathways. These perceptual cues are the Tibetan medical form of biomarkers mediating exposure to outcome and intervention to result.

As described in the last chapter, the body is understood as the accumulation of these bundles of mass, energy and function. The body is defined by the *nyépa*, bodily constituents, and excrements that mutually provide bases and function in development, maintenance and disintegration. One cannot have a body without one of these components. All are all necessary to qualify as a body. Likewise, it is understood that a consciousness[324] and the proper causes and conditions (including *karma*[325]) need to be part of the initial formation of the body, along with the mother's ovum, the father's semen, and five psychophysical elements with their functioning elemental principles. Consciousness must also be propelled by the afflictive emotions[326] in order for the body to form.

If *tripa* is disturbed, it will "burn up" the bodily constituents, causing them to waste away. The hot nature of fire will cause pain, moving from the lower parts of the

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[324] It is important to note that neither the *Four Medical Transmissions* nor commentaries distinguish this consciousness as subtle or gross, it is just designated as consciousness. For example, the *Four Medical Transmissions* uses the term *nam-shé* (རྣམ་ཤེས། TII, Ch 2:38) and Desi Sangyé Gyatso's *Blue Baidurya* uses *bardo nampar shépa*, the intermediary (*bardo*) consciousness (བར་དོའི་རྣམ་པར་ཤེས་པ།).

[325] ལས།

[326] ཉོན་མོངས་ཅིས་བསྒྲུབ་ནས། (TII, Ch 2). Explaining this process is beyond the scope of the current work.

body and regions within which it resides and climbing with burning force into more upper regions. Thus, *tripa* is responsible for all hot illnesses. When *béken* is disturbed, it abolishes the internal fire of the body[327]. Through the nature of solidity and fluidity[328], it creates a heaviness and cooling. Though *béken* resides in the upper body, during disturbance it falls downward from its residence areas into the lower regions. *Béken* is responsible for all cold illnesses. *Rlung* exacerbates both hot and cold illnesses[329]. Just as wind under a searing sun will propagate a burning force like fire, *rlung* incites hot illnesses; likewise, wind carries the freezing capacity of cold, enhancing the cooling effect of any cold illness.

Conditions that cause the development of imbalance are seasonal, behavioral and related to the activities and intentions of the body, mind and sensory organs. Just as described before, the causal conditions for illness and imbalance are the *nyépa*, the mental afflictions, and ultimately fundamental ignorance. Thus, from the Tibetan medical perspective as explained in the previous chapter, conditions are seen as factors that capitalize on these initial causes. Conditions provide metaphorical water, fertilizer, sunlight and all the necessary requirements to bring an illness to fruition from its initial cause. Thus, the arising conditions are seasonal, perceptual-cognitive and behavioral. Excess, deficiency, or adverse conditions for a given season; overuse, underuse and misuse of one's given perceptual-cognitive capacities; and forcing, inhibiting or improperly using one's behavior will incite imbalances in the *nyépa*. For example, excess

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[327] ལུས་ཀྱི་མེ་དྲོད།

[328] The elements of earth and water, respectively.

[329] རླུང་ནི་ཚ་བྱང་གཉིས་ཀའི་ཁྱབ་བྱེད་དེ། (TII, Ch 8)

rain in the rainy season will cause a proliferation of *béken*, deficient rain can raise *tripa*, and rain instead of snow in the winter can cause improper storage of water which will affect the rest of the landscape and seasons thereafter.

An example of what is meant by "arising conditions" is as follows: underutilizing one's hearing sensory organs can cause the capacity to hear to atrophy and a similar degeneration in kidney function. Overthinking can cause a proliferation of *rlung.* Intense fright can have adverse effects on all the sensory organs, including the mind. Forcing the body's urges, like bowel movements, can cause an excess in downward-voiding *rlung*[330] and lead to hemorrhoids. Inhibiting the urge to urinate can cause malfunction in the bladder and ureters. Improper behavior in terms of engaging in the ten non-virtues of killing, stealing, sexual misconduct, lying, slander, harsh speech, idle talk, covetousness, malicious intent and wrong views[331] (TII, Ch 13), can also lead to imbalances in body, speech and mind.

One of the pathways through which such behaviors can affect physiologic function is through what is called *dhang*[332], which can be translated as radiance or supreme vitality. *Dhang* is the final product in the sequential production of the bodily constituents. The text says,

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[330] ཐུར་སེལ་བྱེད།

[331] སྲོག་གཅོད་རྐུ་དང་ལོག་པར་གཡེམ་པ་དང་། རྫུན་དང་དག་འཁྱལ་ཚིག་རྩུབ་དབྱེན་སྨྲ་བ་དང་། བརྣབས་སེམས་གནོད་སེམས་ལྟ་བ་ཕྱིན་ཅི་ལོག ཞེས་པའི་ལས་བཅུ་ལྡན་དག་ཡིད་ཀྱིས་སྤང་།

[332] མདངས།

> Supreme vitality (*dhang*) is the final product beyond the production of regenerative fluid[333]. Although it resides in the heart, it pervades the entire body. It sustains life, vigor and resplendent radiance. (TII, Ch 5:56)

Dhang is considered a qualitative indicator of the health and well-being of an individual. It resides on a subtle level, as the passage above indicates, residing primarily in the heart, but permeates the bodily constituents. When someone's complexion looks pale or absent of vitality, one would comment that their *dhang* is diminished[334]. In fact, the subtle energy that resides in the heart during *tukdam*[335], or meditative equipoise in the death state, is related to *dhang* and considered a subtle form of *rlung*.

In the pathology section of the *Explanatory Transmission*, the text observes that "Suffering diminishes *dhang*, causing fear, emaciation, weakness, depression and a loss of radiance" (TII, Ch 11). Here, the term suffering, *dü-ngal*,[336] has a distinct connotation of mental suffering as well because it is the classic term for suffering used in the Buddhist literature. Desi Sangye Gyatso also glosses it exclusively as extreme mental

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[333] This could also be translated as the ultimate perfection of regenerative fluid. As Desi Sangye Gyatso notes, one way to remedy insufficient *dhang* is to prescribe medicine that increases virility, as well as listen to scriptural teachings, take regenerative medicines (*julen*), and consume foods of sweet taste, meat broth and milk. These will also prolong life. ལུས་རྒྱངས་དྲངས་ཚན་མས་ཀྱི་མཐར་ཐུག་པའི་མདངས་ཞེས་བྱ་བའི་སྲོག་གི་རྟེན་དེ་ནི་སེམས་ལ་སྣུག་བསྟལ་ཆེན་པོ་སྐྱེ་བའི་དབང་གིས་ཟད་པར་འགྱུར་བ་ཡིན་ཏེ། དེའི་རྟགས་སུ་ཡང་ཡང་དྲངས་ཤིང་སྐྲག་པ་སྐྱེ་བ་དང་། ལུས་རིད་ཅིང་ཉམ་ཆུང་བ་དང་། གང་ལའང་མི་དགའ་བའི་ཏིང་སྐྱེས་ཤིང་གཟི་མདངས་ཉམས་པར་འགྱུར་བ་དེའི་ཕྱིར་མདར་བའི་སྡེ་ལ་སོགས་པ་འཚོ་

[334] དཔེར་ན། མདངས་ཉམས་སོང་།

[335] ཐུགས་བསྟམས།

[336] སྣུག་བསྟལ།

suffering in the *Blue Beryl* (2007a:230)[337]. Because one's behaviors integrally affect the bodily constituents in how the *nyépa* proliferate, deteriorate, and deviate, engaging in behavior that produces mental suffering will also affect the physiologic and subtle effects of these pathways—'subtle' primarily referring to the subtle *rlung* pathways and activities throughout the body due to the mind-*rlung* relationship. *Rlung* disturbances will aggravate all existing dysfunctions and illness conditions. The ten non-virtues, along with many other indications in the *Four Medical Transmissions* of behaviors to avoid, are instructed primarily as a means to avoid mental suffering.

Likewise, in understanding the environmental conditions that cause a *nyépa* to accumulate or deplete, arise or diminish and pacify or aggravate, the *Four Medical Transmissions* present details in terms of the causes, natures and seasons. Diet, behavior, medicinal substances and activities that have a rough, light, hard or subtle quality along with warmth can cause *rlung* to accumulate. The addition of cold contact causes it to manifest, and oily and warm qualities applied causes it to pacify. Understanding these principles permits for the diagnostician to assess where *rlung* is in its trajectory of imbalance or balance. When a disorder is in the accumulation[338] phase, it is collecting in its native location in the body. When it encounters causal factors, it becomes disturbed[339], and the patient craves qualities of diet, lifestyle and mental behavior that are unsuitable[340] for that person. As the disorder manifests, it enters regions other than its native location,

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337 སེམས་ལ་སྡུག་བསྔལ་ཆེན་པོ་སྐྱེ་བ།

338 གསོག་པ།

339 འཁྲུགས་པ།

340 མི་མཐུན་ཡོན་ཏན་འདོད།

and the actual symptoms of the disorder manifest. These symptoms manifest in the pulse, urine, tongue, physiological cues and characteristics discovered during the patient interview and physical assessment. Thus, knowing the conditions that lead up to the manifestation of disease will help the diagnostician assess what context was present to facilitate the development of disorders in the patient. The pathology chapters delineate the specific arising conditions that cause imbalances in each *nyépa* (TII, Ch 9: 75-77) and the specific diagnostics to look for in case of each disturbed *nyépa* (TII, Ch 11:82-84).

Diagnostic theory chapters

The three chapters in the *Explanatory Transmission* are different from the *Root Transmission* diagnosis chapter in that they are entirely theoretical with no specific diagnostics for a given illness. The three chapters begin with a metaphor to illustrate how diagnostic theory works, described as "recognizing the signs." The text says, "As with the way in which smoke is related to fire, recognizing signs in diagnosis is like seeing the face of illness" (TII, Ch24: 164). The metaphor continues,

> Without analytical methods, the doctor, having not been able to recognize the significance of the sign itself, will make errors like mistaking steam for smoke, or saying it will rain whenever clouds gather. These are signs of uncertainty. And due to that uncertainty, oral instructions for diagnostic methods are essential. (TII, Ch24: 164).

In his *Blue Beryl* Commentary on the *Four Medical Transmissions*, Desi Sangye Gyamtso quotes his predecessor Zurkharwa's *Oral Instructions of the Ancestors* (1992:

567) saying that, “For each superficial symptom, [an inferior] physician will mistake the uncertainty of the sign for definitive meaning” (2007:452).

The *Explanatory Transmission* provides a justification for why the subject matter of these three chapters of diagnosis comprise the main diagnostic theory: “Because of the necessity of providing proper prognoses and treatments, analysis based on the actual manifestation of the *nyépa* is presented; in order for the physician to be revered and recognized as an expert by people, analysis by indirect skillful means (literally, way of faults, malintent, and deception) is presented; and because of the need to provide worthwhile treatment, the four possibilities of accepting and rejecting a patient is presented.”

The first chapter on diagnosis in the *Explanatory Transmission* is called “Diagnostics Based on the Actual Manifestation of the *Nyépa*.”[341] This chapter provides an elaboration on the diagnostic modes that were discussed in the *Root Transmission* diagnosis chapter, and further expands diagnostic theory. It is here that we see the role of perceptual cues and embodied knowledge as foundational to Tibetan medical diagnostics. Likewise, we see the requirement that the physician develop embodied skill to employ the instrument of his or her perceptual faculties and mind in the diagnostic process.

“Diagnosis Based on the Actual Manifestation of the *Nyépa*” has four parts to the chapter: the arising conditions that manifest the disease, analyzing the defining characteristics of a disease, and assessment of that which benefits and that which worsens

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[341] ཉེས་པ་དངོས་གྲུབ་ཀྱི་བཤད་པ། Also translated as “Diagnostic Principles Based on the Actual Manifestation of Nyépa” (Dharamsala MTK 2011).

the illness. All four subjects target the analytical approach to differential diagnosis: understanding the etiology, pathology, and behavior of the disease. Arising conditions focus on the dietary and behavioral conditions that gave rise to the illness. Analysis of the symptoms comprise basis, object, context, and means of analysis[342]. The basis of analysis is the *nyépa* that is being analyzed: *rlung*, *tripa*, *béken* or the compounded combinations. Often this is referred to as the "illness base."[343] Thus, the basis looks at whether there are signs of proliferation, deficiency or disturbance of the *nyépa*, and determines its hot or cold nature accordingly.

The objects of analysis comprise the five sensory organs and the five excretions. The five organs are the eyes, ears, nose, tongue, and body, and the five excretions are mucus, diarrhea, vomit, urine and blood. The contexts to be analyzed refer to conditions that instigate the arising of illness. They comprise location, season, constitution, life stage, time of day, hunger state, and affected region. The context of location[344] is the environment that instigated the illness, such as if the patient was recently in a cool, breezy area that facilitated *rlung* to proliferate. The context of season[345] is the time of year when the illness arises or worsens, such as summer when the illness may have worsened.

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[342] Glossed as the context to be analyzed (གང་དུ་བརྟག་པའི་སྐོར་བསྟན་པ།) (TII, Ch 24).

[343] ནད་གཞི།

[344] ཡུལ།

[345] དུས།

Constitution is the basic psychophysiologic makeup of a person that predisposes them by type to certain illnesses, such as a person with a general *rlung* constitution having a susceptibility to *rlung* illnesses. Life stage[346] is the period of life of the person by age that has its own predisposition to certain illnesses and contributes risk or buffer factors toward or against certain illnesses, such as an elderly person being at greater risk for *rlung*-driven disorders of the nervous system. The context of time of day[347] looks at how the symptoms vary over the course of the day and related periods of severity. The context of food consumed[348] addresses how the symptoms relate to degrees of digestion, such as if the illness worsens with hunger or immediately after consuming food. The context of illness region[349] is areas of the body where symptoms are located and if and how symptoms originate and transmit, such as dull pain isolated to the upper stomach or neuromuscular pain originating in the back and radiating down laterally along the upper legs.

The means of analysis are the same three modes of diagnosis presented in the *Root Transmission* chapter: observation, palpation and interrogation. Here, in the *Explanatory Transmission*, these means are similarly elucidated as observation focused on tongue and urine, and palpation focused on pulse. However, in this section, palpation is elaborated to include investigating the body generally and inspecting specific areas affected by illness. Here, interrogation is elaborated in more detail and importance than in

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[346] ནད་ཚོད།

[347] ཉིན་ཞག

[348] ཟས་རོས།

[349] གནས།

the Root Tantra. It describes inquiry as an essential part of the diagnostic process because it targets the specific *nyépa* cause, the region of the body affected by illness, and is able to differentiate the specific defining characteristics of the illness. It asks questions of which, how, where, when and what[350].

The last section of this chapter looks at the aspects of diet, behavior, medicine and external treatments that help or harm the condition. This mode of analysis helps to uncover the underlying root cause and nature of the disorder. The text says that the physician must be persistent in gaining insight into the actual disease without being distracted by superficial appearances[351], and must do so by gaining experience and realizing the proper means of treating the patient[352]. This is a critical part of the embodied knowledge that must be accrued for diagnostic means. Although the text is referring to questioning the patient, it is identifying the importance of experience and insight into assessing the superficial appearance of a disease compared to its underlying causes.

Thinking back to the example in Chapter 2 of my personal experience with *trak-tsab*; it had all the diagnostic characteristics described of *rlung-tsab* in the text. Thus, superficially, this disorder presented as *rlung-tsab*, but it had short chronicity and was primarily driven by blood (*trak*[353]), requiring specific medicines that supported proper blood generation and pathways. Due to the superficial appearance of the disease, I thought it needed to be treated with primarily *rlung* pacifying medicines and therapies

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350 གང་གིས་གང་ལྟར་གང་ན་གང་དུ་གང་། (TII, Ch 24)

351 ལྟར་སྣང་མ་ཡིན་བསྒྲིབས་པས་རྟོག་ལྷུར་ཉེ།

352 སྨན་པས་ཉམས་རྟེད་ནད་པའི་གསོ་དོན་ཤེས།

353 ཁྲག

that are warming and nourishing. This approach is different than would be used for treating *trak-tsab* as the underlying causes which actually needs different medicines and external therapies that are cooling and purifying for the blood. For example, though both conditions have a *rlung* component in the etiology, during my first years with the condition, if too much heat was applied to my lower abdomen and sacral-lumbar region, the symptoms would worsen, an indication of *trak-tsab*. When the condition arose again many years later and converted to *rlung-tsab*, it required constant heat application to quell the cascade of symptoms that would ensue if not addressed early as the menstrual cycle initiated each month.

The second diagnostic chapter in the *Explanatory Transmission* refers to "Indirect Skillful Means in Diagnosis." This chapter has various sections to foster patient confidence in the physician, as well as means for the physician to uncover difficult diagnostic information[354]. First and foremost, it requires the physician to be thoroughly acquainted with all differential diagnostics that may identify the illness. Just like a gem specialist's ability to distinguish between authentic and fake gemstones, a physician must have the most nuanced capacity to distinguish characteristics of one disease from another and among all its sub-types and variations. This includes theoretical information about how the illness arose, but also includes the praxis embodied understanding of fine perceptual qualities of pulse, urine, physique, habitus and so forth of the patient.

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[354] This chapter has eight parts: understanding the definitional characteristics of a disorder, uncovering information, taking one's time with the patient, investigating prior treatment courses, patient reticence to disclose information, patient over disclosure of information, and declaring clear diagnostic cases.

Taking one's time with the patient is enumerated as a distinct skill that physicians should cultivate. Here the text says that one should take time with the patient, listening to and asking questions of the patient, investigating the patient's condition, and observing the patient's behaviors and presence[355]. This aspect of the textual instruction seemed unsupported by what I observed in the clinic and with many of my mentors. At Men-Tsee-Khang, I observed a hundred patients line up at 5:30am in the morning and Amchi Tamdin would finish seeing all of them by 9 or 10am. Amchi Khenrab also saw a large number of patients at his home before he began his regular work day. During our patient rounds at the Tibetan medical hospital in Xining, we conducted patient rounds of all hundred beds in two hours. My mentors took pulse, looked at urine if the patient had a sample, asked a few questions and then wrote a prescription. In fact, when I received permission to apprentice with the His Holiness the Dalai Lama's personal physician, Amchi Tamdin, he said, "There's not much you are going to learn from watching my do pulse diagnosis. But I want you to look at my prescriptions—*that* is where the real learning is." I was not sure if this was his way of dismissing my interest in learning diagnostics from him until I proved myself worthy. Or if there was real triangulation to engage by looking at his prescriptions to understand his initial diagnoses and, even more so, to gain insight into how he treats patients.

The chapter also emphasizes that the physician should attend to the patient without distraction. This seemed evident and consistent across my mentors—the moment of non-distraction, particularly while taking pulse. Non-distraction is an important

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[355] དུས་བསྒྲིང་རིངས་སྐབས་མ་ཡིན་ཐང་ཅིག་གནས། དེ་བར་ལུས་ངག་མ་ཡེངས་གཏམ་ལ་དཔྱད། (TII, Ch 25).

concept with a larger Buddhist context to which it refers. Likewise, it has significance relevant to the self-development practices in which the physician is expected to engage, some of which are alluded to in the text. I will discuss these practices further and their function in the next chapter.

In Konner's ethnography *Become a Doctor,* he describes the value of spending time with the patient and listening as both diagnostically and therapeutically invaluable. The patient's story can elucidate specific symptoms that do not always correlate to a specific condition or disease (1987:98). Likewise, it can impress upon them behaviors that drive illness experiences and etiologies. It can support compliance, and teach them how to function with new conditions. But most of all, it demonstrates one's care and concern — for them as human beings. Konner notes this insight from one of his resident physicians, "What matters is that you put your ass in the chair, and keep it there. Not near the edge of the chair. Way back in the chair. You don't look at your watch. You don't think about the other thousand things you have to do.You just sit there and stay there and listen and say a few words. Mainly you listen. But the most important thing is that you stay" (1987:152-3). Konner describes the need for physicians to develop humanistic values, that time, conversation and physical contact are often what the patient yearns most for from the physician (1987:124). He also notes that the "therapeutic alliance"—"a doctor-patient relationship tending to promote understanding of the illness and compliance with the treatment—is sometimes greatest with the medical student" and that the medical student is often in "a uniquely good position to give comfort" (1987:130).

For example, the last chapter of the *Explanatory Transmission* describes the qualities and experience required of a Tibetan physician. It specifically details that physicians should cultivate the six perfections. It says, "Regarding the conduct that a physician should adopt and abandon, the ten non-virtues should be abandoned; insanity, haphazard conduct, foolishness, immorality, and malevolent behavior should be rejected; and generosity, ethical discipline, patience, and diligence should be practiced"[356] (TII, Ch 31). Related to this instruction for non-distracted attention to one's patient is the quality of *samten*[357] or single-pointed concentration.

Desi Sangye Gyatso describes this quality of mental focus (*dhyāna*[358]) as critical: "Through the supple ease of the body and mind, one can have the concentration of residing in full bliss and giving a distinctive happiness [to both self and others] in this lifetime"[359] (2007:509). Here, the term "supple ease"[360], or *shinjang,* can also have the connotation of "fully cleansed" "complete purification" and "total refinement" as in *shintu jangba*[361], or purifying completely. It demonstrates the need for the physician to undergo a refinement of mind and body to be able to impart proper benefit to the patient. This is important in understanding the nature of embodied knowledge in Tibetan

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[356] སྒོ་བ་སྣང་བྲང་གཉིས་ལས་མི་དགེ་སྤང་། སྐྱོ་ལྷལ་ཐོ་རེ་སྨིག་པ་དན་སྒོང་དོར། ཕྱིན་དང་ཚུལ་ཁྲིམས་བཟོད་པ་བརྩོན་འགྲུས་སྦྱང། (TII, Ch 31). Although only four of the six perfections are described, the commentaries elaborate that this section refers to all six perfections, adding concentration and wisdom, as that which should be cultivated by the physician (Desi Sangye Gyatso 2007:508).

[357] བསམ་གཏན།

[358] བསམ་གཏན།

[359] དགེ་བའི་དཀྱིགས་པ་ལ་རྟེ་གཅིག་ཏུ་གནས་པ་ནི་བསམ་གཏན་ཡིན་པས་དེ་ལ་ལུས་སེམས་ཤིན་སྦྱངས་ཀྱི་སྐོབ་ནས་བདེ་བ་ཁྱད་པར་ཅན་སྐེར་བ་མཐོང་ཚོས་ལ་བདེ་གནས་ཀྱི་བསམ་གཏན། (Desi Sangye Gyatso 2007:509)

[360] ཤིན་སྦྱངས།

[361] ཤིན་ཏུ་སྦྱངས་པ།

medicine—the techniques, not unlike Foucault's technologies of the self (Foucault 1988), develop a refined basis, physiologically and mentally, from which to cultivate the greater capacities of perception for diagnostic means, and, though not discussed here, applied also in therapeutic means.

Desi Sangye Gyatso describes that *samten* has three parts: "The concentration of attaining distinctive qualities such as accomplishing extraordinary perceptual capacity[362], miraculous powers, and so forth; the concentration of devoting oneself for the purpose of others; and the concentration of benefiting sentient beings"[363] (2007:509). Here we can see the intersection between the cultivation of *samten* and Dharmakirti's training in *praṃānic* means. We also see the Buddhist and Tibetan medical epistemology framing what heights of skill are possible merely by mastering concentration. The ability for perception itself to become extraordinary marks the highest reaches of possibility for mastering concentration, and thus, perceptual skills. Coupled with this perceptual ability is likewise the application of devoted concentration in benefitting others. In fact, various Buddhist thinkers assert that training in concentration itself will naturally develop a concern for and compulsion to work to relieve suffering of others.

The rest of the chapter on "Indirect Skillful Means" discusses uncovering diagnostically useful information by means other than the direct diagnostic modes, such as questioning family members or other close patient relations familiar with the illness circumstances and able to give diagnostically relevant information. The chapter also

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[362] Also referred to as clairvoyance (THLIB 2017).

[363] མངོན་ཤེས་དང་རྫུ་འཕྲུལ་སོགས་བསྒྲུབ་པ་ཡོན་ཏན་ཁྱད་པར་ཅན་བསྒྲུབ་པའི་བསམ་གཏན་བསམ་གཏན་གྱི་སྐོན་སོགས་ཉིད་དོན་ལྷུར་ལེན་པ་སེམས་ཅན་དོན་བྱེད་ཀྱི་བསམ་གཏན་དེ་གསུམ་མོ།(Desi Sangye Gyatso 2007:509)

discusses examining prior treatment courses and past diagnostic history, providing non-harmful treatment with conditions that cannot be diagnosed, and skillfully restraining the patient from giving too much information so as to engender confidence in the patient through diagnostic means of uncovering the illness. This method aims to demonstrate to the patient that the physician gains all relevant diagnostic information through diagnostic skill instead of that which is relayed verbally by the patient. Performing such astute diagnostics without verbal input from the patient is seen to instill patient confidence in the physician. This approach is used for patients who may be skeptical of the diagnostics, and thus one would not employ the approach of a thorough patient interview which can be an exceedingly important diagnostic means in and of itself, as we have seen with Western medicine (Konner 1987:130[364], 308).

The last diagnosis chapter in the *Explanatory Transmission*, "Determining Patient Appropriateness for Treatment,[365]" describes how to determine which conditions are easy, average, or difficult to treat, as well as those cases for which one should not take responsibility for treating. In addition to identifying specific conditions which are easy, moderate, or difficult to treat, this chapter targets the qualities that the physician, nurse, and medication should have in order to facilitate most expedient treatment for any illness. The chapter also describes patients who have disdain for their physician, who will not comply with treatment protocol, or who have fatal conditions for which the physician should not apply treatments. The commentaries explain the rationale for not treating such

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[364] Konner notes that 85 percent of the information needed to make a diagnosis in Western medicine is in the patient history, with the rest coming from tests (1987:130).

[365] སྨད་བྱད་སྨུ་བཞིར་བརྟག་པ།

patients, because it wastes treatment resources such as medicine and supplies that are difficult to procure and make and would be better utilized on patients for whom they will benefit[366]. Likewise, offering treatment to patients who are uncooperative or disrespectful of the physician can potentially harm the physician's reputation, which itself is important for conferring healing benefit to other patients (Zurkharwa 1992a: 594).

Zurkharwa concludes his discussion of these diagnostic chapters in his *Four Medical Transmissions* commentary by recognizing the importance of the physician's embodied knowledge in recognizing all subtle and gross diagnostic cues to identify an illness. He says:

> Of all the possible subtle and coarse principles of illness, like recognizing the unmistaken sign of a pebble, having gained proper realization, action and analysis, the beauty of the flawless eye of the physicians is revealed. However, many are without eyes to apprehend the objects of cognition whether for illness, diagnostic means or otherwise. Many who proceed on the path of providing medical treatment are as cripples, diagnosing like a momentary flash [of light hitting] bronze. From such conduct, they themselves fall off the precipice into the lower realms. How could one engage the teachings of medical science in name only? Whatever is a *mara* is wonderfully enjoyed. However, like a moth hurling itself into fire, who reverses the progression of karma? Thus, those wishing to

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[366] In the case of dying patients, Zurkharwa, as repeated in Blue Beryl by Desi Sangye Gyatso later) notes that the priority for such patients is supporting the body generally(སྲོག་གཅོད་ཀི་ནད་དགུ་པོ་གང་ཡང་རུང་བས་ནད་པ་དེའི་ལུས་ལ་དམ་དུ་བརྟེན་བ་རྣམས་སངས་རྒྱས་སྟེང་གི་ཐུགས་རྗེ་ས་ཅང་འཚོ་བའི་ཐབས་སུ་འགྱུར་བ་མ་ཡིན་པས་སྨད་བར་བྱའོ།) (Zurkharwa 1992: 594; Desi Sangye Gyatso 2007a: 463). The passage continues that even with the benefit of a thousand buddhas since there is no treatment method, the patient should not be taken on [for treatment].

> study from such an individual, must investigate that individual first! (Zurkharwa 1992a: 595)[367]

Here Zurkharwa recognizes the importance of realization, action and analysis[368], embodied knowledge cultivated and deployed. He warns that many in the medical field are "crippled," or lame, in the means of diagnostic skill. He uses this particularly embodied metaphor to describe their deficient skill, linking the skills to not only intellectual knowledge but also embodied capacity. As we recall, the mind is one of the six senses in this ontology, so embodied knowing encompasses all perceptual bases — mind and senses.

Preparing the physician's body & perceptual cuing: pulse and urine analysis chapters

Before presenting several case studies to illustrate some of the critical textual points in diagnosis, we turn to the final two diagnostic theory chapters of the *Four Medical Transmissions* — that of pulse analysis and urine analysis — which are the first two chapters in the *Subsequent Transmission*, the final section of the *Four Medical Transmissions*. Although we have yet to cover the diagnosis-specific chapters in the *Oral Instructions Transmission*, the third section of the *Four Medical Transmissions*, I choose

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[367] ཕྱ་རགས་ནད་ཀྱི་རྣམ་པ་ཇི་སྙེད་ཀུན། མ་འདྲེས་རྟགས་ཅན་རེ་ཤེ་དོན་འཛིན་ཕྱར། རྟོགས་བྱེད་དཔྱད་གསུམ་རིག་པས་མཛོས་པ་འདི། སྨན་པ་རྣམས་ཀྱིད་ཀྱི་མེད་མིག་གཅིག་ཡིན། དེང་སང་འདི་ན་ནད་དང་བརྟག་ཐབས་ཙོག་གས། གཞལ་བྱ་འཛལ་བྱེད་མིག་དང་བྲལ་འགའ། དོས་འཛིན་འཁར་བ་ཐ་རྨངས་འཕྲུགས་བཞིན་དུ། སྨན་དཔྱད་ལམ་ལ་གོམ་པ་འཐུར་བ་མང་། དེ་འདྲས་རང་ཉིད་དན་འགྲོའི་གཡང་ས་ལ། འཕེན་པར་བྱེད་འདི་བསམས་ན་གསོ་རིག་གི བསྟན་པ་ཞེས་བྱའི་མིང་ཙམ་གལ་ལོང་། འདི་ཅི་ཡིང་སྐྱབས་ལོངས་སྤྱོད་རྣང་དུ་བྱུང་། འོན་ཀང་ཁྱེ་ཕེབ་མེ་ལ་འཕྱོང་ལ་སོགས། རྣམ་བཀྲ་ལས་ཀྱི་བགྲོད་པ་སྐུ་ཡིས་བརློག་ནེ་ཤེས་ཀྱི་ཐུགས་འདོད་རྣམས། ཐོག་མ་ཉིད་དུ་བརྟག་ཐབས་འདི་རྒྱངས་ཤིག ཅེས་བྱ་ཡང་བར་སྐབས་ཀྱི་ཚོགས་སུ་བཅད་པའོ། (Zurkharwa 1992a: 595)

[368] རྟོགས་བྱེད་དཔྱད།

to cover these two chapters first because this is how we learned the content at Men-Tsee-Khang, and it is how it is presented at Sorig Loling as well.

In these chapters, it becomes explicitly clear that the physician must prepare his body in order to properly conduct diagnostic analysis. Reciprocally, each of these chapters provides instructions on the preliminary practices a patient should undertake to get a proper reading in the morning. However, it is also understood that the physician should prepare his body for the diagnostic session. As stated in the *Blue Beryl*, quoting from the *King of the Moon* text,

> The physician should abstain from adverse sleep conditions, consuming alcohol, extreme physical exertion, and overuse of speech. The physician should take care not to fall susceptible to mental distress, and should maintain well-being of mind; likewise, the physician should take care not to fall susceptible to physical distress, and should maintain well-being of body. Likewise, the physician should give up being in intimate contact with women[369]. Through clear constitution, he should evaluate the patient. (Desi Sangye Gyatso 2007b: 518)

Here we see detailed instruction that the physician's physical and mental well-being shall be maintained in order to provide proper diagnosis.

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[369] Here we see the dominant sociocultural context of Tibetan medical practice during the time of Desi Sangye Gyatso (1653-1705). Most physicians were monastics at this time. A general indication of refraining from intimate contact, particularly the night before conducting patient's diagnostics relates to the physician as a undisturbed vessel, the embodied diagnostic instrument. In order to make a clear diagnosis, the afflictive emotions of desire, anger, and delusion should be substantially reduced. Intimate contact can create coarse and subtle waves of mental event sequences of all three classes of afflictive emotions and, thus, is understood to disturb the diagnosis.

Metaphor as complex data organizer

Throughout the diagnostic sections of the *Four Medical Transmissions*, metaphor is not only used to teach the theoretical infrastructure of Tibetan medicine—how the body is understood and its physiology, how disease processes function and their assessments, how therapeutics work and their indications—but it is also the perceptual data one must procure from the patient. These data, woven into the fabric of metaphor, provides a technique for complex data organization. Instead of collapsing the pulse to a single point of beats-per-minute number value, or a quantification of the red blood cell count in a given volume of blood, metaphor layers physiological information related to multiple body systems in the perceptual experience of the pulse. A *rlung* pulse floats, intermittently rests, and bursts like a balloon when pressure is applied. Draaisma (2001) has described metaphor as an "efficient storage of information," (17) a formula to recover past experiences swiftly, and thus, a linguistic mechanism to capture perceptual content with greater fidelity.

Classifying illness: levels of categorization

Tibetan medicine presents various etiological paradigms for classifying illness: *nyépa*, primary, type-specific and location-specific (TII, Ch 12: 93)[370]. In one paradigm diagnosis simply involves *nyépa*: *rlung*, *tripa* and *béken*. At other times, blood is added as if it were a *nyépa*, and sometimes *chu-ser* is also added as a fifth. Another paradigm is

[370] དེ་ཡང་ཉེས་པ་གཅོད་པོ་རིགས་གནས་བཞིའི། དབྱེ་བ་བཞི་བརྒྱ་རྩ་བཞིའི་ནད་ཡོད་དེ། (TII, Ch 12: 93)

called primary classification[371] and comprises two forms: self-path[372] and other-path[373]. A condition that comes from one's own pathway, called "self-path", and one that comes from another pathway, called "other-path," is also clarified in the general hot illnesses chapter. The text reads, "The divisions of hot illness by pathway comprise self-pathway and other-pathway. An exclusively self-path origin condition clearly manifests the symptoms of its own principal energy. That of other-path origin has dual compound and triple compound symptoms" (TIII, Ch 12: 205). Gen Rinchen Dhondup observes, "For self-path conditions, the urine, pulse and symptoms will clearly demonstrate the *tripa* characteristics of its own self-pathway" (Dhondup 2015.03.10 rec 23:25-24:40). He describes how they clearly manifest heat symptoms because they are arising from the *tripa* pathway. He says, "An other-path condition, like *rlung*-heat or *béken*-heat or a fully compounded condition provides mixed symptoms" (Dhondup 2015.03.10 24:40- 29:00 listen again). If it is *béken* and heat, then it is a conflicting[374] condition. The last two kinds are called type-specific and location-specific.

These classifications in the *Four Medical Transmissions* act as individual classification schemes as shown below in the table designed by Kalsang Trinley for the pathology course (Kalzang Trinley 2011:89). It demonstrates the classification divisions for illnesses common to all genders and life stages[375].

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[371] གཅོར་བོ།

[372] རང་རྒྱུད་ཅན།

[373] གཞན་རྒྱུད་ཅན།

[374] འཁྲབ་པ།

[375] ཀུན་ཁྱབ་ཐུན་མོང་གི་ནད། (TII, Ch 12: 85-86)

Table 1. Classifications of Common Illnesses										
Nyépa			Primary		Location		Type			
rlung	*tripa*	*béken*	self-path	other-path	Body (ལུས།)	Mind (སེམས།)	Internal Illness (ཁོང་ནད།)	Wounds & Trauma (རྨ།)	Hot Illnesses (ཚད་པ།)	Miscellaneous Illnesses (ཕོར་བུ།)

The etiology paradigms also can also nest hierarchically, as shown in the table below, with *béken* as the example *nyépa* (as in Kalzang Trinley 2011:95).

Table 2. Etiology Paradigms for *Béken*				
Béken Illnesses (33)	Self-path (28)	General Classifications (13)	Type-Specific (6)	Sternum Illness, Iron Slag Illness, Fire-Accompanying Disorder, Esophagus Obstruction, White *Drumbu* (Arthritis), Digestive Malfunction
			Location-Specific (7)	Skin-impacting, Muscle-spreading, Channel-traveling, Bone-adhering, Vital organ-transmitting, Vessel organ-descending; and a general location of appearing in the five sensory organs
		Specific Classifications (15)	Supporting *béken* imbalance, Decomposing *béken* imbalance, Experiencing *béken* imbalance, Satisfying *béken* imbalance, Connective Tissue *Béken* imbalance (each has an additional *rlung*-compound form and *tripa* compound form)	
	Other-path (5)	Yellow (*béken* + *tripa*) (1)	Yellow *Béken* (same as *Tripa Kha Lü* མཁྲིས་པ་ཁ་ལུད།)	
		Brown (*béken* + *tripa* + blood) (4)	• Dispersing (བྲེར་བ།) • Spreading (རྒྱས་པ།) • Upwelling (རྫོལ་བ།) • Crouching (འཁྱིངས་པ།)	

The *rlung* chapter of the *Oral Instructions Transmission* clarifies the distinction between type-specific and location-specific *nyépa* imbalances (TIII, Ch 2). The

characteristics of the *nyépa* transform in imbalance and manifest as symptoms distinctly for each[376] (Desi Sangye Gyatso 2007a: 529).

> A type-specific imbalance adversely enter a pathway other than its own. […] A location-specific imbalance remains in one's own pathway and enter one's own objects of harm.[377] (TIII Ch 2:120)

The objects of harm, *nöd-cha[378],* are the respective bodily constituents and excrements for each *nyépa*. Desi Sangye Gyatso explains the type-specific imbalance further:

> The nature of type-specific imbalances occurs when the *nyépa*'s definitional characteristics have blended with the definitional characteristics of another *nyépa* and through excess-deficiency-disturbance and at the time of imbalance, leaves one's own pathway and erroneously enters the portals into the pathway of another *nyépa*.[379] (2007:526)[380]

He describes the location-specific as: "From the proliferation [of the functional *nyépa*] solely in its own pathway, the *nyépa* enters the [respective] objects of harm"[381] (2007:527). For example, in explaining the mode of entrance for the disorders (TII, Ch 10), Desi Sangye Gyatso says, "For those [locations], symptoms manifest in accordance

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[376] སྐྱེད་མཚན་ཉིད་དྲུག་ལྡན་དེ་ཉིད་རྣམ་ཐྱད་ནད་ཀྱི་རྒྱས་བསྟན་པ་ལ་ཡང་སྐྱེ་བརྒྱ་པ་དང་བྱེ་བྲག་ཏུ་བརྒྱ་པ་སྟེ་རྣམ་པ་གཉིས་སོ། (Desi Sangye Gyatso 2007a: 529)

[377] སྐྱེ་ལང་བྱེ་ན་རིགས་དང་གནས་སུ་སྐྱར། རིགས་ནི་གཞན་རྒྱུད་ལོངས་པའི་ལམ་ལུགས་པ། ‴ གནས་ནི་རང་རྒྱུད་གཞོད་བྱ་ལ་ལུགས་པ། (TIII, Ch 2: 120)

[378] གཉོད་བྱ།

[379] དེ་ལ་སྐྱེད་ནད་ཀྱི་རིགས་ཀྱི་དབྱེ་བའི་རང་རང་གི་མཚན་ཉིད་གཞན་ཞི་མཚན་ཉིད་དང་འདྲེས་ནས་འཕེལ་ནད་འགྲུགས་ཤིང་རྣམ་པར་མ་ཐྱར་པའི་དུས་ཀྱི་རང་རང་གི་རྒྱུ་ལམ་མ་ཡིན་པར་གཞན་ཞི་རྒྱུ་ལམ་བརྒྱུད་ནས་ལོག་པའི་བྱ་གའི་ལམ་ལུགས་པ་ལ་རིགས་ཀྱི་ངོ་བོ་ཞེས་བྱའོ། (Desi Sangye Gyatso 2007a: 526-7).

[380] The twenty rlung-type (which condense to eight), four tripa-type, and six béken-type imbalances arise from this etiology.

[381] སྐྱེད་ནད་གནས་ཀྱི་དབྱེ་བའི་རང་རྒྱུད་ཙུང་པ་འཕེལ་ནས་གནོད་བྱ་ལ་ལུགས་པ་ལ་གནས་ཀྱི་དབྱེ་བའི་ངོ་བོ་ཞེས་བྱའོ། (Desi Sangye Gyatso 2007a: 527)

with each *nyépa's* own characteristics"[382] (2007a:225). The chapter on disease classification in the *Explanatory Transmission* glosses location-specific as the six modes of entrance and the five sensory organs (TII, Ch12: 86-87). This is why when a *nyépa* enters another *nyépa's* location, it manifests the symptoms specific to the *nyépa* of that location not that of the *nyépa* penetrating the location.

For our first exam at Men-Tsee-Khang we wererequired to provide definitions for type-specific imbalances and location-specific imbalances. In preparation for the exam, the clearest explanation we found was from the *Blue Beryl*. I was surprised that these concepts were not more clearly elucidated in the commentaries. However, this was a characteristic to which I would become accustomed, and I quickly realized that the specificity comes from the oral instructions of one's teacher, most frequently in a clinic, rather than the root text or commentaries. This is the oral side of the textual tradition where transmission from a teacher forms an essential core. Trickster, opaque, and misleading portions of the root texts essentially mandate oral transmission as well.

Diagnostic theory in action

In order to illustrate diagnostic theory in action and clarify how the textual content is enacted clinically, I will present a few case studies from mentoring moments with senior physicians to highlight the embodied modes of diagnosis and points of nuance and challenge.

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[382] དེ་རྣམས་རང་གི་མཚན་ཉིད་རྣམ་སུ་མཐུན་པའི་ནད་རྣམས་འབྱུང་། (Desi Sangye Gyatso 2007a: 225)

Case #1. Uncovering the root in illnesses with hot-cold conflict

Andrea is a sixty year-old business education professional who came to me as a patient in the spring 2015 after I had graduated from Sorig Loling and saw patients privately in Atlanta while writing up my dissertation. She had a multitude of health conditions she wanted to address. She described experiencing digestion difficulties as a child due to a condition called Hirschsprung's disease, where regions of her colon lacked proper nerve bodies to regulate colon activity and allow for stool to pass effectively. She explained to me that her particular case affected her small intestine and stomach as well. She experienced chronic bowel obstructions throughout her childhood; and up until her mid-twenties, she had frequent constipation and bloating. A vegan diet for seven years and frequent abdominal massages helped regularize her bowel movements to about every other day. Thereafter she was able to return to a fairly normal diet reincorporating meat and now has daily bowel movements, though with continued high sensitivity to diet.

She came to see me when she experienced increased and intolerable intestinal cramping, as well as back pain from a previous herniated disc compression at the fourth vertebral lumbar disc. She had been able to continue long-distance running despite the low back and hip pain associated with the disc, and the related pain radiating down her legs laterally causing numbness in the bottoms of her feet. Other issues she described in our first meeting included high levels of depression and anxiety, recurring hot flashes that are no longer controlled by the hormone replacement therapy that she has taken for the last six years, and hypothyroidism for which she has taken levothyroxine for four years.

Over the last decade, she noticed pronounced varicose veins on both her legs, for which she decided to do invasive vein ablation therapy.

I treated her for nine months, combining diet and lifestyle recommendations, daily oral medicine and biweekly treatments of an externally applied medicinal oil salve *numchee*[383] with focused heat, and alternating sessions of *kunye* Tibetan massage with *hormey*[384] medicinal compresses and stationary dry cups. Her digestion had improved significantly over the months, as had the pain in her lumbar spine, pelvis, and knees. She reported that before seeing me she often could not bend down to pick something up off the floor without experiencing pain and significant rigidity. After treatment sessions, she experienced normal full range of motion and no pain for several days to a week before it would return. The experiences of normal range of movement felt revolutionary, she said. Even though the pain and rigidity returned after several days, the post-treatment days were wonderful, she commented.

I had been pleased overall with her progress on the medicine and external therapy treatment responses except for the continuation of sleeplessness due to heat flash events[385]. My diagnosis had shown coolness in her kidneys, reduced digestive fire and a hidden *béken mukpo* condition that would arise and cause pain in her upper gut under the sternum occasionally when she was hungry and after not observing the recommended

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[383] སྨུམ་འཚོས། I pronounced in the Amdo dialect of *numchee* since this is where I had gained my practical training in its application along with the other external therapies during my internship.

[384] ཧོར་མེ།

[385] The relapses of pain and rigidity after treatment were partly structural for which we were working on building supportive strength, balanced toning and flexibility through her introduction to a highly structured Ashtanga yoga approach.

dietary and lifestyle recommendations. Her symptoms demonstrated a *rlung*-derived habitus, a concept called "constitution," which will be explained in more detail later[386], and beyond the hot flashes, her symptoms, pulse, urine, and tongue seemed indicative of a root cold *rlung* condition with underlying *béken* influence. I approached Amchi Khenrab for his guidance on the case. As my first teacher in Tibetan medicine, we had discussed many patient cases together, and I value his oral instructions particularly his clinical skill and ability to describe diagnostic and treatment nuances in detail. Also, the previous March, I saw patients with him at the local Drepung Buddhist Center in Atlanta. Many of the patients we saw together had followed up with me to get refills for their medicine and update check-ups. I checked in with them about their cases. Sometimes he asked his wife, one of the main Men-Tsee-Khang clinic doctors in Dharamsala, to send medicine to the patients from India. Otherwise, he directed me in modifying the prescription or providing refills for a given number of additional months per patient.

Now I felt hesitant to ask him questions. As a graduate, I felt that I should not be asking my teacher as many questions since I was now seeing my own patients. Furthermore, I was not sure how my Tibetan medical knowledge compared to that of my classmates who were just graduating this year as well. Given my internship experience at the Tibetan medical hospital in Xining and seeing how I compared to my MTK classmates there as well as receiving feedback from my mentors, I felt confident that I was where I should be for a recent graduate of the bachelors program in Tibetan

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[386] Her wiry frame, light complexion, loquacious disposition, intolerance to cold, light sleep, pleasure in music, debates, laughter and competitions, taste for sweets, spicy and sour, and rlung-type physique matches that as described in the text (TII Ch 6:63).

medicine. However, most of my SLL classmates would be entering situations where they were working in hospitals in an apprenticeship-like situation under the supervision of senior doctors. They would not be expected to see patients on their own as I was doing. Nevertheless, recognizing that I was an older student and would be heading back to embark on my own practice in the United States, my mentors expected this trajectory for me and reminded me that I was more than prepared to see patients on my own.

When I asked Amchi Khenrab about Andrea's case, I gave him a short history of her condition, my diagnosis, and prescribed medicine course, treatment, and progress over the last many months. I described how the treatment had been largely successful except for her continued nighttime hot flashes and consequent sleep interruption.

He initially commented, "Foreigners tend to be difficult to diagnose and treat because of their complex conditions. They have many disorders that are compounded together and often persist for years, becoming old, chronic issues. Thus, clarifying the underlying issues is difficult."

Amchi Khenrab's first question regarding the source of her night sweats was whether the patient was heavy set or thin in build. He was concerned that the heat production was due to excess fat tissue. Tripa can enter fat tissue and, compounded by aggravated *rlung*, generate excess heat. As we had discussed before, the functional energetic systems, bodily constituents and waste products share interdependent natures of basis and dependents. Thus, each functional *nyépa* shares relationships with specific bodily constituents and waste products. The imbalanced energetic systems harm the related bodily constituents, which eventually also harm the associated waste products.

When ingested substances have characteristics similar to the characteristics of a given principal energy (functional *nyépa*), the pervasive *rlung* spreads the qualities of that *nyépa* to the various body cavities. The nutritional essence[387] collects in that particular body cavity; and if the body cavity is defective in function or physiology the disorder accumulates and progresses due to the person's lifestyle and behavior at that time. It is like the gradual accumulation of clouds before an impending rain. When the accumulating disorder comes into contact with the manifesting condition, the disorder courses through the six pathways of skin, muscle, vessels, bone, vital organs and vessel organs and the full manifestation of the disorder emerges and causes dis-ease[388]. It is at this time that symptoms of the illness appear. Disturbance of the *nyépa* is described as when a *nyépa* exceeds its proper amount, and one *nyépa* enters the resident location of the former[389].

For Andrea's case, Amchi Khenrab was describing when *tripa* had entered a location where *béken* disorders tend to arise.[390] From the above classification of location- and type-specific disorders, Andrea's condition is type-specific. Amchi Khenrab said, this

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[387] དྲྭས་མ།

[388] This is described in chapter ten of the Explanatory Tantra: དེ་ཡང་ནད་དང་རྒྱུ་མཐུན་ཟས་ཀྱི་བཏུད། ཁྱབ་བྱེད་རླུང་གིས་བྱ་གར་རྣམས་སུ་གཏོར། དེ་ཚོ་དྲང་མ་གང་དུ་ཆགས་ཐུར་ཁ། བྱ་གའི་སྐྱེན་དང་དེ་དུས་སྦྱོང་ལམ་ཕྱིས། མཁའ་ལ་སྤྲིན་འདུས་ཆར་པ་འབབ་པ་བཞིན། རང་རང་གནས་སུ་འཛེལ་ཞིང་གསོག་པར་བྱེད། བསགས་པ་ཉུན་ཐུང་དེས་པ་ཁོ་རང་ལྟར། ལམ་དྲུག་ཞུགས་ནས་བདེ་མེད་ནད་འབྱུང་འབྱུར། (རྒྱུད་གསུམ་ལས། 78)

[389] འཁྲུག་པ། ཉེས་གསུམ་རང་གི་ལུང་ཚོད་ལས་འཛེལ་བ་ལ་གཉིས་ཡོད་པའི་ཕྱི་མ་ཉེས་པ་གཞན་གྱི་གནས་སུ་ཞུགས་པ་ལ་བྱ་ཞིང་། འདས་ཚོག་ལ་འཁྲུགས་ཞེས་འབྱེད། (བོད་ཡུགས་གསོ་རིག་ཚོག་མཛོད་ཆེན་མོ། Jampa Trinley 2006:89); in the case of disturbed fever (འཁྲུགས་ཚད།) བཉེན་པ་ཡུལ་ཀྱི་ཉེས་པ་གསུམ་འཁྲུགས་པས་རྐེབ་ཁྲག་ཚད་བསྡེད་པར་བྱས་ནས་ནད་ཟུངས་ཀྱི་མཚན་ཉིད་རྣམས་འདྲེལ་ཤིང་ཡན་ཚུན་འཁྲུགས་པར་སྣང་པའི་ཚད་པའི་མིང་། (གསོ་བ་རིག་པའི་ཚོག་མཛོད་གཡུ་ཐོག་དབོར་རྒྱན། Wangdu 1982: 71)

[390] The text says: "Béken imbalances occur in the chest, throat, lungs, head, dangma, muscle, fat, bone marrow, regenerative fluid, feces, urine, nose and tongue sensory organs, and undigested regions" (TII, Ch 10).

is a case for the Critical Chapter on Hot and Cold Illnesses[391]. “These kinds of illnesses can be difficult to diagnose because their symptoms appear as cold illnesses yet their essence is as a hot illness,” he said. “The hot illness is hiding somewhere and we need to look at where it is hiding. Here it is likely to be *tripa* that has penetrated the *béken* region of fat and is therefore a hidden hot illness (*khabsey*[392]).”

The hot illnesses chapter relates that the essence of a hot illness emerges when the heat of *tripa* exceeds its baseline level. “Thus, the main cause of heat is *nyépa tripa*,” said my hot illnesses class professor, Rinchen Dhondup (2015). The text describes how one must unveil the mask of a hidden hot illness to show its true character[393] (TIII, Ch12: 206-7). You can do this by seeing how the patient reacts to diet primarily, as well as lifestyle and various treatments secondarily as needed. If it is hidden heat, a warming diet should worsen the condition and a cooling diet should benefit the condition. When heat hides in a *béken* location, cold symptoms appear, but one needs to treat it as a hot illness.

I explained to Amchi Khenrab that she is quite thin in build; and though she described being overweight as a child, and having much anxiety around gaining weight again, she has an overall light frame. He said that heat building over the night indicates that there is hidden heat somewhere. “She would not be experiencing that kind of heat in the night unless there was a hidden hot condition,” he said.

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391 ཚ་གྲང་གལ་ཆེད།

392 གབ་ཚད།

393 གབ་ཚོད་གྲང་བའི་མགོ་སྨྲར་མ་བཀྲམ་ན། གཉེན་པོ་ནད་ཀྱི་ཕོག་ཏུ་མི་འབབ་པས། མགོ་སྨྲར་བ་ཀྲམ་ལ་ནད་དང་གཉེན་པོ་སྦྱད། (TIII, Ch 12: 210). Literally, “For hidden heat disorders, if you do not shave the hair from the head of a cold illness, the antidote will not properly strike the illness. If you shave the hair from the head, the antidote will be properly delivered to the illness” (author’s translation).

The hidden heat chapter of the *Oral Instructions Transmission* says, the cause of hidden heat is cold *rlung*. It says, "Initially, it hides underneath béken and rlung in its own place, and thus is called 'primordially hidden'"[394] (TIII, Ch 18: 250). As the Hidden Heat chapter describes, "Hidden heat conditions that are location-type comprise those in the stomach, kidney and heart. Even though the heat enters the location, because they are cold *rlung* locations, the heat hides deeply and the general symptoms manifest as cold *rlung*" (TIII, Ch 16: 250-1). "Hidden heat is like a concealed fire because both the cold and *rlung* cover the head [of the hot illness]. Underneath the *béken* and *rlung*, the heat symptoms lie dormant. Because the exterior is cold and the interior is hot, it is called 'hidden' (TIII, Ch 17: 251).

There are two types of hidden heat conditions: those endowed with the strength of heat and those endowed with the strength of cold. Those with heat strength[395] manifest primarily heat symptoms, those with cold strength[396] demonstrated cooler symptoms. Andrea's condition demonstrated the latter form. As the text says, "That endowed with cold strength has a sinking and lethargic pulse, the urine is blue and does not change rapidly. The face is light-colored and body thick. One experiences discomfort when hungry, runny noses, a dull mind, and finds a warming diet and lifestyle suitable" (TIII, Ch 18: 251). Likewise, for Andrea, her pulse, urine and body matched these symptoms, including the gut discomfort that would arise occasionally when she was hungry that

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[394] དང་པོ་རང་གནས་བདང་རླུང་འོག་ཏུ་གཡ། དེ་ཕྱིར་རང་བཞིན་ཡེ་ནས་གཡ་རུས་བྱ། (TIII, Ch 18: 250)

[395] ཚོན་སྐྱེབས་ཅན།

[396] གྲང་སྐྱེབས་ཅན།

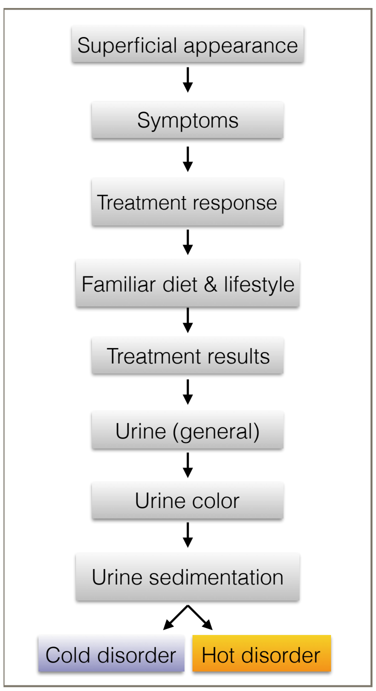
could easily be associated with her early childhood Hirschsprung's condition. Likewise, *rlung* compounded with heat produces insomnia, tremors and sighs (TIII, Ch 12: 206).

So how would one identify that this is a hidden heat condition? As the Critical Chapter on Hot and Cold Illnesses explains, it is important to identify whether the external symptoms and the actual cause are consistently both hot or both cold, or if the condition appears as a hot illness, but is actually cold or vice versa. The chapter reads, "Even though the actual nature of the condition is hot, because the external symptoms are cold, one mistakes it. Insomnia, vomiting, sore joints, yawning, shivering, nonsensical speech, and hiccoughs are indications of a hot illness even though they appear related to a cold illness" (TIII, Ch 13: 225). "Based on the symptoms, one can embark on an erroneous treatment path. If one treats the condition using heat-based antidotes, one may endanger the patient's life due to adding heat" (TIII, Ch 13: 226). "Thus," the chapter continues, "Not based on the apparent symptoms, but based on actual patient response to treatment will this error be clarified." This exemplifies diagnosis as a process through time that builds on clinical logic, treatment, and patient response. One may see alleviation of certain symptoms but not the overall condition. For example, Andrea showed good progress in treating almost all her symptoms, but her underlying core of heat remained and manifested in the evening cycles of *tripa*.

The Critical Treatise on Cold and Hot Illness says,

Error due to superficial appearances inferred by the illness name[397] will be clarified by the symptoms. Error due to superficial appearances of symptoms will be clarified by treatment [response]. Error due to superficial appearances of treatment response will be clarified by familiar diet and lifestyle. Error due to superficial appearances of familiar diet and lifestyle will be clarified by what is produced by the treatment. Error due to superficial appearances of what is produced by the treatment will be clarified by the urine generally. Error due to superficial appearances of the urine generally will be clarified by the color of the urine. Error due to superficial appearances of the color of the urine will be clarified by the sedimentation in the urine. From there, it is impossible to err.

Figure 5. Hot-Cold Disorder Differential Diagnosis Hierarchy



This differential diagnosis hierarchy is particularly useful in assessing conditions difficult to ascertain and is one of the most important sequences in Tibetan medical diagnostics. The diagram left illustrates the differentiation series.

Likewise, Dr. Dontse provided a helpful clarification for me during my apprenticeship with him in the Outpatient Department of the Tibetan Medical Hospital. I asked him about the stanzas in the Pulse Diagnosis chapter of the Subsequent Tantra that read: "It is possible for there to be a hot disorder in the vital organs and a cold disorder in the vessel

[397] The actual text writes "illness base" (ནད་གཞིའི་ལྟར་སྣང་འཁྲུལ་སོ་རྟགས་ཀྱིས་བསལ།) only not specifying that the name of the condition may be the source of confusion. However, Samdrubgyal (2010:135) clarifies that this refers to the term used for the condition.

organs simultaneously; but it is not possible for there to be a hot disorder in the vessel organs and a cold disorder in the vital organs" (T4, Ch 2:220).

He explained that this rule holds generally for the vital and vessel organs except in the case of cirrhosis or complete malfunction of the liver like *chingüd*[398] where the liver, a vital organ, is cold, but the gallbladder, the related vessel organ, would experience a heat disorder. That section of the *Four Medical Transmissions* continues, "Thorough understanding of the specifications of the pulse characteristics enables the physician to provide detailed differential diagnosis of the disorders without confusion and with realization of their rigorous distinctions" (T4, Ch 2:220).

The "Boundary Between Mountain and Plain Hot Illnesses" chapter begins by describing the importance of oral instructions on critical points so as not to make an error in diagnosis and treatment[399] (TIII, Ch 14: 228). Here again we see the employment of a metaphor to provide conceptual nuance regarding the spectrum of hot and cold disorder etiologies and their relationships. Desi Sangye Gyatso explains, "The term mountain-plain[400] seeks to demonstrate meaning by use of metaphor. By descending a mountain, one arrives at the border of the plain, but on that border, one needs to distinguish the mountain from the field[401]. Likewise, due to diminishing [the heat of] a hot disorder [through treatment] one produces [a condition on] the border of cold *rlung*. One must [be

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[398] མཆིན་རྒྱུད།

[399] ཚ་བའི་ནད་རྣམས་གཉེན་པོས་བློོག་སྟ་ཡང་། ཚ་བ་བཅོས་རྩེས་གྲང་བ་སྐྱེས་པ་ཡིས། ཚ་གྲང་འཁྲུལ་ནས་གཞན་ཕྱི་སྟོག་འདོར་བས། དེ་ཐང་མཚམས་ཀྱི་དོས་འཛིན་བཅོས་པའི་ཐབས། འཁྲུལ་མེད་གཞད་ཀྱི་མན་ངག་བསྟན་དུ་གསོ་ལ། (TIII, Ch 14: 228)

[400] དེ་ཐང་།

[401] ཀླུང་ས།

able to] differentiate that threshold[402]. Thus, it is called the mountain-plain border[403] or the melt-freeze border[404]. Like during the freeze of winter, water that is melted by the heat of the sun is frozen again by cold [conditions]. If one breaks a hot disorder by [providing] too much coolness, one can produce *rlung* from [excessively] reversing the hot disorder. The mountain-plain border is like a small bird alighting on a threshold[405], one does not know whether it will land inside or outside the threshold."[406]

Depending on the speed at which a given *nyépa* proliferates (Desi Sangye Gyatso 2007a:720), there are three dangerous paths that one must tread on the boundary of conditions that exemplify three times in the course of treatment: an early invitation for *rlung*, waiting along the path for *tripa*, and severing the aftermath for *béken*.

Relevant to Andrea's case, in the *béken* section of the "Mountain-Plain Border of Hot Disorders" chapter, the text reads, "When heat transmits into a *béken* region, heat does not manifest, but cold symptoms transpire"[407] (TIII, Ch 14:232). "The pulse is slow, the urine is blue-hued, the patient experiences a loss of appetite, the tongue is moist, face

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402 སོ་མཚམས།

403 རི་ཕང་མཚམས།

404 ཞུ་འཁྲུགས་མཚམས།

405 ཐེམ་པའི་ཁར།

406 The entire passage reads: རི་ཕང་ཞེས་དེས་དོན་འཚོལ་བ་སྟེ་དེས་ན་རི་ཟད་ནས་ཕང་དུ་སྐྱེའམ་མཚམས་ཡིན་ལ། དེའི་མཚམས་སུ་རི་ཀུངས་ཀྱི་བྱེ་བྲག་ཕྱེད་དགོས་པ་ཤུར་ཚད་པ་ཟད་མཚམས་སུ་གྲང་རླུང་སྐྱེ་བས་དེའི་སོ་མཚམས་བྱེ་བྲག་ཕྱེད་དགོས་པ་ནི་རི་ཕང་མཚམས་སམ་ཞུ་འཁྲུགས་མཚམས་ཞེས་བྱ་བའང་། དཀྱུན་ཆུ་འཁྲུགས་པ་ཉི་མའི་འོད་ཚོས་ཞུ་ནས་སྐར་དེ་གྲང་བས་འཁྲུགས་པ་ཤུར་ཚད་པ་ཆོག་རླུང་སྐྱེས་པར་བསིལ་ཐལ་ན་སྐར་ཚད་པར་ལྷོག་པས་དཔེར་ན་ཐེམ་པའི་ཁར་བྱེའུ་བབས་པ་ཕྱི་ནང་གང་འབབ་མི་ཤེས་པ་ཤུར་ཚ་གྲང་ལ་མཚམས་ཞེས་པའི་དོན་ཟོ། (Desi Sangye Gyatso 2007a: 720; Zurkharwa 1992: (find page))

407 This passage reads: བྱིས་པ་བད་ཀན་གྲངས་ཤས་ཆེ་བ་དང་། བད་ཀན་ཡུལ་དུ་ཚོ་བ་བབས་པ་དང་། མ་སྨིན་གཏུར་བསིལ་ཚོ་བ་བྱེར་རྒྱུན་འདོར། ཚོད་གཞུག་མི་མངོན་གྱང་རྟགས་ཁ་ཡར་འོང་།

is light-colored, and food is difficult to digest. Because of the dormant quality [of heat], it is mistaken for a cold disorder. Thus, when one relaxes one's diet, the condition will reverse into a hot disorder. If it is let to go for a long time, it will develop into *mü-chu*[408]. Otherwise, there is only small harm done by letting it elapse. Because of that, one must extinguish the heat and cut the aftermath." The section proceeds to give the diagnostic indications that the heat has been extinguished. Thereafter it gives treatment instructions on how to rehabilitate the gut since treating a hot disorder requires cool potency medicine that can harm the digestive heat. So even though the symptoms look cold in nature, one must treat the hidden heat to resolve the entire condition. Without targeting the underlying cause, a remnant of the illness will persist and cause long term serious issues.

With Andrea, we saw that she improved throughout the treatment for most of the condition, but the underlying heat persisted and manifested in the form of night sweats. Thus, as Amchi Khenrab asked me, "In this case where the *nyépa tripa* has entered a *béken* region through the exacerbation of *rlung*, do you treat the *béken*, *tripa* or *rlung* in this case?" I responded, "You treat the heat, along with the *rlung*."

This made sense in terms of the mode of diagnostics that uses treatment response as diagnostic information. Andrea responded to the cooler formulas for her neuromuscular and arthritic pain in her pelvis, lower back and hip joints, but not the warming formulas for the same symptoms. Her treatment response disclosed an etiology for her condition rooted in hot illness. Her case exemplifies a classic condition of hidden heat that has entered the *béken* region, primarily the fat, with aggravation by *rlung*. It

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[408] དམུ་རྒྱུ། A condition of internal fluid accumulation such as advanced ascites or edema.

produced cold symptoms that superficially look like a cold disorder, but are actually a hot disorder in nature propelled by *rlung*. As the Hot Illnesses chapter describes, one must "treat as if chasing someone on the run" and "shave the hair off its head [to reveal its true nature], and then give the illness the [proper] medicine" (TIII, Ch 12: 209). After several more months of administering a formula that collects and expels heat, Andrea's hot symptoms reduced from waking her hourly throughout the night to only one or twice in a given night. At six months, the hot symptoms rarely occurred.

Case #2. Tripa *constitution with cold symptoms*

Jenny is in her mid-sixties and has a thin tall build, wiry frame, elegant demeanor, and understated presence. She came to my private clinic in fall of 2015 out of concern for the osteopenia she has experienced in her pelvis and spine over the last ten years that had progressed in her spine to osteoporosis in the last year. She said that she has not experienced many symptoms prior to this past year when she started feeling strong pain in her left hip radiating down her left side, and a feeling that her face and tongue are "swollen." She said she has lived a purposeful life working as a nurse for many decades and has a strong family with a loving husband and two beautiful daughters. She loved her work in nursing, though felt burnt out by the long hours, patient load, and demanding expectations on nurse performance. She describes with a tone of curiosity that many of her close friends exhibit a passion and drive for life that she does not share with the same expressiveness, though she clearly had a deep passion for patient care and close family and community connections. She said recently she has felt a "calling back to her source"

and does not feel as “awake” anymore. Jenny is reserved in her expressions and communications, but strong in her intellect and analytic capacities.

As alluded to in the earlier patient case, constitutions are an underlying physique with various predispositions and risk factors that a given individual has in this lifetime. A constitution comprises physical characteristics as well as mental patterns, cravings, desires, inclinations and risk factors for various conditions. It is considered an important baseline to assess before analyzing the imbalance variations of pulse, urine and physiological cues that will indicate disorder, illness or dis-ease. There are seven constitutions: *rlung*, *tripa*, *béken* and the related double and triple combinations (*denpa* and *duepa*, respectively[409]). Each person has an underlying constitution as well as a life stage constitution that contributes to any arising illness constitution. For example, someone might have a *béken* constitution, but everyone generally has a slightly more *béken* constitutional influence on their underlying constitution as children until age sixteen. Likewise, adults age sixteen to seventy experience a *tripa* constitutional influence on top of their underlying constitution, and likewise for a *rlung* constitutional influence in the elder years after age seventy. Constitution has many corollaries to the Maussian use of habitus, and Bourdieu’s interpretations thereafter.

In our first session together, Jenny described her preference for spicy, sour, salty bitter and astringent foods. She said her disposition seems to be distinct from many people in this society who crave sweets and sugars, for which she has little desire. I spoke with her about constitutions in Tibetan medicine and expressed some surprise that she has

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[409] ཕྱན་པ་དང་འདྲེས་པ།

a liking for the flamboyant tastes of spicy, sour and salty given her general physique and disposition. I noted that she has a constitution that indicates dual influences of *béken* and *tripa*.

A *tripa* constitution has a desire for thirst and greater metabolic strength so such individuals tend to be hungry more often and have a faster digestion. Such individuals have a general yellow hue to their hair and skin, a sharp intellect, greater pride bordering on arrogance at times, likelihood to sweat more profusely and have generally stronger body odors. They tend to have a moderate size physique and crave sweets, bitter, astringents and cooler foods. They tend to have the physical characteristics of a tiger or monkey.

A *béken* constitution has a cooler body, minimal protrusion of the bones and joints, greater physical mass, a lighter complexion, general aptitude to manage afflictive emotions, as well as greater ability to tolerate hunger, thirst and life difficulty. They tend to live longer lives, be prosperous in material gain and success, and sleep deeply. They crave spicy, sour, astringent and rough foods, and tend to have a lion- or garuda-like appearance.

Jenny demonstrates qualities of a dual béken-tripa constitution with a slightly stronger *béken* influence. With such a constitution, an individual has a greater predisposition to imbalances of each of these *nyépa*. For Jenny, since she has a more dominant *béken* influence and bone is a *béken* region, bone loss and related neuromuscular pain as her predominant imbalance to manifest in late life makes sense

due to the compounding factor of greater *rlung* imbalances later in life on top of her *béken-tripa* constitution.

Bone loss can happen from a multitude of pathways from the Tibetan medical perspective. At a basic bodily constituent level bone loss could stem from the inability to produce and maintain enough bone, thereby being a *dangma mazhuwa* issue, which translates as "metabolic disruption of the nutritional essence." *Dangma mazhuwa* is a metabolic disorder where fire-accompanying *rlung*[410] insufficiently separates nutritional essence (*dangma*[411]) from waste product (*nyikma*[412]), and waste product leaks into the pathways that should be carrying nutritional essence to the bodily constituents. When waste product enters the nutritional essence stream, radiance-transforming *tripa*[413] cannot properly produce healthy blood (*süng trak*[414])[415], and such improper blood and waste products accumulate over time in the liver to produce a *dangma mazhuwa* condition. There are numerous conditions that arise from *dangma mazhuwa.* These include: tumors, edemas, toxin accumulation disorders, cancer, arthritis, gout, eye conditions, blood vessel conditions, neural disorders, gastric illnesses including ulcers, spleen conditions, and so forth.

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[410] མེ་ཉམས་རླུང་། One of the five sub-types of *rlung.*

[411] དྭངས་མ།

[412] སྙིགས་མ།

[413] མངར་སྐྱུར་མཁྲིས་པ། One of the five sub-types of *tripa.*

[414] ཟུངས་ཁྲག

[415] Literally, cannot properly "ripen" the blood to have the proper healthy qualities. The text reads: མངར་སྐྱུར་མཁྲིས་པས་ཟུངས་ཁྲག་མ་སྨིན་ཏེ། (TIII Ch 6:169)

Conversely, bone loss can also be due to the "burning" of bodily constituents through excess *tripa* and heat. Thus, it could be bone wasting away from excess digestive fire. The text says:

> The body's fire exists in the digestive system itself, yet parts of that heat reside in all bodily constituents such that a waning fire proliferates the bodily constituents and an inflamed fire incinerates the bodily constituents. Because the constituents are formed from their predecessors, those that form earlier can support the development of those which form subsequently, and those earlier in the sequence that do not form will consequently debilitate those later in the sequence to form. (TII, Ch 11: 80)

With the wasting away of bone, one would expect other related diagnostic characteristics of hair, enamel and fingernail loss. With Jenny and the *béken-tripa* constitution, it could be either. However, her diagnostics are more consistent with insufficient digestive fire and constituent *mé-drö*, instead of excess.

Case #3: Seeing cancer through pulse and urine[416]

In the spring of 2014, during my first year studying at Sorig Loling and interning for patient rounds each morning in the gastroenterology department, I had my first experience of assessing a pulse as indicating cancer, which in this case maps onto *dré-né*[417] in the Tibetan medical nosology[418], without prior information about the patient. As

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[416] See chapter appendix for field notes on this case.

[417] འདྲས་རྙེ།

[418] See Tidwell 2017 and Tidwell *forthcoming* for analyses in Tibetan and English, respectively, of how biomedical cancer maps into the Tibetan medical nosology.

usual, I followed my mentor Dr. Drukjal, a mid-level physician in the department, into the first patient room on our normal morning rounds. Beds 3 and 4 had seen many patients during the seven months of my time thus far in the gastroenterology department. As we approached bed #3, I noticed it was a new patient. His body was thin, frail and had the appearance of *lü züng nyampa*[419]—wasting away of the bodily constituents. I reached to take his pulse as Dr. Drukjal asked how he was doing. The patient had been admitted to the department a couple days prior, and Dr. Drukjal was already familiar with his case. His general pulse lacked strength[420] and felt like it was "wasting away" — somehow similar in pulse as what stood out to me initially about his overall appearance.

The upper part of my left ring finger on his arterial pulse which correlates to his liver (which I refer to as "his liver pulse," for shorthand) felt like there was a small bead —similar to what the text describes as a tiny bead—rolling across his pulse. Though subtle in the overall signature of this pulse, I was struck by the prominent quality that resembled the metaphor the text describes and which I had noticed in *dré-né* patients I had examined before. Also like the others, the pulse had a twisting and protruding quality[421] to it, signifying a proliferation of blood[422] in this region, which is consistent with *dré-né* etiology. His right kidney pulse also had some of this quality. His lung pulse was quiet, as if under siege.

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[419] ལུས་ཟུངས་ཉམས་པ།

[420] སྟོབས་ཆུང་།

[421] འདྲིལ་ལ་འཁྱར་དུ་སྟོང་།

[422] The text reads: "A pulse indicating a blood disorder is protruding and rolling." ཁྲག་གི་རྟོག་འཁྱར་ལ་འདྲིལ་བར་འཕར། (TIV. Ch 1:218). *Drilwa* (འདྲིལ་བ།) has the connotation of rolling, spinning, coiling, twirling, twisting, spinning, and wrapping.

I realized I had not been paying attention to the exchange between Dr. Drukjal and the patient. As I moved to examine the patient's left pulses, the patient said that he had no appetite for anything and vomits anything he tries to eat. My language skills by this point of my time in Amdo had progressed so I could accurately understand patient descriptions of their conditions and properly participate in the interchanges myself.[423] My fingers had wrapped around the patient's left wrist pulse by now, and I focused on his stomach pulse. It also had a pea- or bead-like rolling quality.

It's got to be *dré-né*, I thought.

His heart pulse seemed to surge. By now, I was noticing a pattern in our cancer patients that, beyond the *dré-né* signature in the respective organs affected by the *dré-né*, the heart pulse also seemed to have excess *rlung* and/or a hot-*rlung* signature. This patient's pulse also had that quality, but also a further surging quality that I had not noticed before. I thought back to a few other cases where the heart pulse seemed uncharacteristically protruding. It often seemed to be connected with organs that were not part of the specific organ pulses. There had been a couple thyroid cases, one thymus issue, and a couple of pancreas and brain cases. However, this patient seemed to have accompanying conditions in several of the other organs which the other *dré-né* cases I had seen did not have. Still, I found myself picking out the *dré-né* pattern amidst the

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[423] I still got teased for having a "Lhasa dialect" form of sentence structure, vocabulary and, at times, pronunciation, but I improved significantly from my first few months in Xining where I could barely understand any conversation except that which was in class (due to the use of powerpoints, references to texts and my teachers making an effort to speak in a generalized dialect understandable to those from all Tibetan regions).

other imbalances. I wasn't sure what kind of *dré-né* this patient had, but his pulse did seem to show the same *dré-né* pattern I had seen in prior patients.

As we left the patient room, I pulled the intern aside since he was the best intern student on pulse that Dr. Drukjal had since I had been in the department, "What did you think of the pulse?" I asked him in Amdo dialect, "What'd you get from it?"

"*Töb meyki*[424] (It has no force behind it)" he responded.

"But it also felt like a little bead rolling under it, yeah??" I asked, searching for confirmation of what I had felt.

With bright eyes, as if in recognition of what I was saying, he said, "Yes," with a tone of slight surprise.

"His heart and liver [pulses] have a similar quality," I added.

"Yeah, he's a *sherma dré-né*[425] [pancreatic *dré-né*]," he said.

Satisfied, I walked with him into the next patient room. Dr. Drukjal had been finishing some questions with patient #4, whom the intern and I had already examined, and was just exiting the room to join us in entering the next room.

"That was a *sherma* [pancreas] patient," Dr. Drukjal began explaining about patient #3.

"And *dré-né*?" I asked, for his further confirmation.

"Yeah — could you get that from pulse?!" he asked with a mixture of being surprised and pleased.

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424 སྟོབས་མེད་གི།

425 གཤེར་མའི་འབྲས་ནད།

"Yeah," I said, equally surprised and pleased.

"*Chö shrahge*[426] [You're good]," he said.

I felt both amazed and an ease in how simple the recognition of a *dré-né* pulse had been. Years earlier, when I had been formulating my research topic, it seemed likely that only the experts could determine *dré-né* pulses. As I had begun my research, it seemed more clear that such a pulse was difficult to recognize. However, the more time I had spent at the hospital, the more it seemed that many junior doctors did not take as many pulses because they had so much other diagnostic information to draw from that they did not need to rely on the pulses — and it was only the elder expert doctors who seemed thorough in taking pulses.

"Is it just about applying what the text instructs into practice?," I wondered. I knew this could not be the case because the text is written in many sections in a trickster way; one can never rely on what the text says directly without having confirmation or explanation of the meaning via oral transmission from one's teachers. This seems to have been a skillful way to propagate a medical system—if anyone who was literate could pick up the text, understand it and apply the methods, malpractice and significant harm whether intentional or unintentional could be the result. The toxicology and alchemical chapters, and the relationship between correctly purifying toxins in all Tibetan medicine compounding techniques, are particularly critical, and can be used for ill will in the wrong hands. Tibet has a history of various individuals and villages using poisoning for their advantage, so a medical system aimed at helping others needed proper precautions

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[426] ཕྱོད་རྟགས།

in place. However, thus far, it seemed that for the most part I could directly apply the textual instructions to the clinical setting and gain significant ground.

About a month later, I took the pulses of the patient from bed #3, Gonpo Lhundrup[427], again. He looked weak and emaciated. More breathless with exasperation. I slipped my fingers into position under his right wrist. The pulse was startlingly subtle, more so than the previous Tuesday. It seemed to float in a sense. I remembered what my close friend and Chinese medical doctor Suzannah had said about her partner Suzanne's pulse right before Suzanne passed. She described the distinct shift in the pulse from "strong, pounding with a root," to "floating and subtle." I wondered if I was seeing a similar decline in his condition. I had heard that pancreatic cancer goes quickly. The wife of a friend of mine back in Atlanta had passed of pancreatic cancer in a matter of months after diagnosis, and my professor who also died of pancreatic cancer had passed within six days.

I had noticed before how the patient and his family reported symptoms to me during our check-ups. This time they directed their attention completely to Dr. Drukjal, perhaps realizing that I had little to do with his treatment. Gonpo Lhundrup did not make much effort to look up at Dr. Drukjal. He just said breathlessly, "It hurts a lot. It cramps." "Does it cramp on its own or when you move, eat, and so forth," Dr. Drukjal asked. "On its own, continuously," Gonpo Lhundrup responded. Gonpo Lhundrub had compounding conditions of peptic ulcers and inflammation of the gallbladder.

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[427] དགོན་པོ་ལྷུན་འགྲུབ།

I went around the bed to take his left pulse. This side was much stronger — pounding even. I noticed the protruding quality of his stomach pulse. More inflamed than when I had first looked at a week or so ago. His kidney pulse on this side also seemed "hot" — sharp, with a deep root[428]. His heart pulse also seemed trembling and shaken.

Dr. Drukjal responded with further recommendations for pain management, and then we moved on with the rounds. "It's a very hard case," Dr. Drukjal said to me, "Not much we can do now." "Yes, it seems to be at a critical state (*ha jang jeekah*)[429]," I said. I had a feeling that Gonpo Lhundrup body was still fighting hard, but there was an underlying hopelessness to which it was resigning.

Later, in the physicians' office, as Dr. Drukjal was updating the patient records on the computer, I asked him what difference he saw in Gonpo Lhundrup's pulse compared to a week or so ago. He smiled widely, knowing my focus on pulse in my clinical apprenticeship and recognizing his continued claim that he "knows very little about pulse analysis" anytime I would ask.

"I don't know (*mi xee*)[430]," he said.

"But you took it for a long time," I retorted encouragingly, trying to get him to simply describe what he felt before the cloud of silence descended upon him.

"His heart seems quite frail," he said, "His heart is not good. It's not doing well."

I felt grateful that Dr. Drukjal was willing to describe even this much with me this time.

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428 འགྲིམས་པར་འཕར།

429 ཧ་ཅང་སྐྱི་གི

430 མི་ཤེས།

Most doctors in the department simply say, "*Mi xee* (I don't know)," when I ask them about what they assessed in a given pulse. It seemed largely due to a lack of confidence in themselves and their ability to assess pulse. In the text, pulse is described as one of the "grand messengers" of diagnosis and a patient's condition; and, as the texts further describe, a good pulse reader can tell almost anything from a pulse. Thus, it seems doctors will say very little about how much or little they get from a given pulse reading for concern of disclosing the skill or lack thereof[431].

There seemed to be a challenge in learning pulse due to the high expectations of one's self and what one could gain from a pulse, particularly looking to the example of the expert physicians, and the processes required to learn the basics and build up to exemplary proficiency. I noticed a similar tension among students in my animal tracking studies. Particularly in the Tracking School, of which I was a part of for years, the founder and main instructor could tell remarkable things from a given track: the direction the animal's head was looking when they walked by, gut issues, emotional state and so forth. Legends of the skills of great trackers motivated new young trackers to push their observations and build the skill repertoire to reach these capacities. However, sometimes the legends and the great skills of their ancestors, blinded new trackers and made them restless in learning the initial basics. In order to learning tracking, one needs a strong foundation in the simple characteristics of foot shape, gait, stride, and substrate aging to move on to the more complicated skills. New, and even many old students, became

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[431] Tibetan medicine tends to be highly competitive. Minimizing the potential for jealousy, arrogant appearances, and attracting sabotage may play a role in this cultural resistance to open sharing of pulse readings, or even formalizing comparisons for education purposes and/or standardization.

fixated on stories describing the “magical” skills of the old great trackers that they would not even try to learn the basics. Instead students tried to progress directly on to “pulse releases” to describe the internal physical and mental condition of the animal and so forth without ever describing what animal it was, how big, how fast and in what gait they were traveling.

In the Tibetan hospital, new interns barely put their fingers on a wrist to take a pulse, explaining that “they know nothing about taking pulses.” My hunch was that they felt if they could not discern the fine details that a pulse (by legend) promises to offer, then they had no business taking pulses. I tried to convince them that they would not get any better at reading pulses if they never took pulses. My comments were often met with a smile. The head of our department Dr. Takdrug Tserang scolded them frequently in our grand rounds together, “See this foreigner, she always takes pulses and she’s not even Tibetan. Aren’t you embarrassed? This is your own medical system and she has more passion than you do!” These comments often motivated more widespread pulse-taking for several days, and then the interns and junior doctors returned to their normal approach and reliance on the symptomology and biomedical labs. I wondered how much a culture of modesty in a modern environment with many students with many teachers inhibited their willingness to take pulses in front of others. A more traditional setting of one teacher with a handful of close students might provide conditions for them to feel communally unrestricted to engage more fully in diagnostic learning.

Two and a half months after first seeing Gonpo Lhundrub, I noticed his condition had deteriorated significantly. At this point, he was in critical condition. During the

morning assembly where the nurses read the significant events from patients from the night watch, they mentioned that he had a 39°C temperature.[432]

As we entered the room, I noticed he had lost quite a bit of weight, startling since he was already quite thin and emaciated. Two nurses were taking blood from his right shin near his ankle. They withdrew several vials. It was clear they had already tried taking blood from his inner arm veins from a couple nurses assisting by holding cotton swabs to keep the areas from bleeding. “Does it hurt?” the nurses asked.

I was standing by his right side by this point. He seemed not to hear, and I repeated the phrase closer to him so he could respond. He nodded, as if it took all the energy he could muster to do so. I felt hesitant to take his pulse. He and his family knew I was just a student, a doctor apprentice. I waited until all the doctors left except Dr. Drukjal who was observing the nurses finish taking the blood for a couple more vials.

I slipped my fingers around his right pulse. Fluttering, subtle, rootless, fast, floating and slightly trembling. The trembling seemed to come from his lung pulse, and the floating, racing, from his liver. His right kidney seemed silent. After taking his pulse, I touched his wrist warmly acknowledging the tremendous suffering I had watched him go through the past couple months.

I remembered what Dr. Drukjal had told me when I asked if there would be a time where we would call a rinpoche or specific monastery to conduct specific rituals for him.

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[432] I knew he had initially come from a biomedical hospital to the Tibetan hospital because the doctors at the biomedical hospital said that they could no longer do anything for his condition. However, our hospital was an integrative medicine hospital and administered Western medicines at the discretion of the patient. I was thus still surprised to hear that fevers were treated with solely with Tibetan medicines. Here, it was *Agar* 35, for his *rlung*, and *Manu Zhi Thang*, for the fever. Perhaps it was at his request that only Tibetan medicine be used.

Dr. Drukjal had already enacted the hospital protocol for patients in serious condition. “His family has already done all of that, and I’m sure they are doing the appropriate rituals now as well,” he said. “And he knows what to do,” Dr. Drukjal continued, referring to Gonpo Lhundrup’s familiarity with the Tibetan Buddhist prayers, recitations and visualizations commonly done at the time of death. “He knows there is not much we can do for him. He knows where to put his mind [in these days],” he continued. And it seemed true.

Over the news few days when the nurses read the patient reports from the previous night, they read, “Patient bed #4, fever of 38^{o}C,” (we had moved to our new building where Gonpo Lhundrub had been shifted to patient bed #4); they followed with, “But reports that he is not in poor spirit[433].” His family also seemed seriously concerned, but mostly in silent prayer.

A week later, when Dr. Drukjal had work outside the hospital and Dr. Yangdrungtso was overseeing his patients, we began patient rounds with Gonpo Lhundrup’s room. As we entered, a new patient was in the bed. After conducting the normal check-up for rounds, I asked Dr. Yangdrungtso about Gonpo Lhundrup. “He was dismissed from the hospital a couple days ago,” she said, “And went home. We heard he just passed.”

My heart felt both the aching sadness and relief — he had been in significant distress, and seemed ready to move on. I felt comforted to know that he was able to return home to make the transition. In Tibetan Buddhism and culture, death is one of the

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[433] ཡིན་ན་རེ། སེམས་མི་བདེ་རྒྱུ་མེད་གི་རེར། “But he doesn’t say he is unhappy.”

most significant times of one's life, for it provides the gateway to the next rebirth, and one's continued striving toward enlightenment. Death provides one of the most important times to put one's mental focus toward an auspicious rebirth in which one can gain further progress toward this goal. It seemed he had the time, mental resolve, and peace to use his condition to recognize his impending passing, and allow for his mind to focus on this transition.

It was the first experience of seeing the progression of a pulse from a serious life-limiting condition into death. I had read the passages in the pulse diagnosis chapter of the *Subsequent Transmission* many times, but the experience of seeing the pulses come alive with a real patient, and, even more so, having such a personal connection to this patient, made the quality of these pulses vivid in my embodied memory, the sensations imprinted onto my fingers.

Chapter conclusion: Dialectic reflections

As I gained more experience of diverse conditions; relationships to patients, their specific etiologies and sociocultural contexts, and the progression of their cases; and deepening my relationship to the text through recitation, study, discussions with mentors and contemplating the content, I could see that this system of layering conceptual and perceptual experience is a lifelong endeavor. The understanding that decades are required to gain deep knowledge and experience became more and more apparent to me. Every day felt like volumes of embodied knowledge and insights were being imprinted onto my body, creating new karmic imprints, to use language from Dharmakīrti's theory; however,

the vast degree of possibilities for any given individual to exhibit for any given illness is limitless, and thus it humbled me to this system of slow development of expertise in embodied knowledge for understanding and eliminating suffering.

In the following chapter, I will discuss the way expertise is understood in Tibetan medicine and how it relates to cognitive science research on expertise as well as the version of expertise in Dharmakīrti's account of *pramāṇa*. I will then present some of the mechanisms Tibetan medical pedagogy uses to actively facilitate expertise among physicians.

Chapter VII
Embodied Knowledge Manifest:
Expertise in methods of becoming as methods of diagnosis

To be able to rigorously distinguish among the five aggregates, to reverse the poor view of grasping onto a self, and to realize the nature of all composite phenomena—that is how one becomes an expert.
—Tamdrin Gyal[434]

Life is short, and art long; opportunity fleeting; experiment perilous, and decision difficult.[435]
— Hippocrates

Part I. Expertise in Tibetan Medicine

We learned the chapter on "Activities and Qualities of the Physician"[436] early in our medical education, midway through our second year at MTK, a similar curricular timing to when my classmates learned the chapter at SLL prior to my transfer. At both schools, the entire class was dedicated to this single chapter that concludes the *Explanatory Transmission*. At MTK, principal Gen Tenchö taught the class, as he did for many of the classes that were considered the most theoretically important. Such course responsibilities both at MTK and SLL indicated seniority and often denote a higher level of experience. Although I found Gen Tenchö's classes difficult to follow because of his style of long commentary, this class and chapter excited me because it finally explicitly detailed how Buddhist practice relates to Tibetan medicine, and how great physicians become great. On one level, the most ideal physicians described by this chapter seemed a far reach. Similar to descriptions in *namtars*, hagiographic biographies of accomplished

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[434] Tamdrin Gyal 2006:217

[435] *Ars longa, vita brevis, occasio praeceps, experimentum periculosum, iudicium difficile.*

[436] བྱ་བྱེད་སྒྲུབ་པ། (TII, Ch 31)

figures in Buddhist and medical history, the descriptions resounded with mythical flare and legendary prowess in skill. Although conveying a practical description of the qualities and perspectives we must cultivate as physicians, the chapter also contains many depictions that feel extraordinary and intangible, larger-than-life skills and characteristics that only could exist in some supramundane realm. In many ways, it felt similar to the mythic heroes of other cultures that exemplify a society's highest ideals to illustrate the idealized form of behavior and motivate its attainment. However, here, such figures were not only legendary role models, but were situated within practices that specifically instructed us how to cultivate these very characteristics within ourselves.

The "Activities and Qualities of the Physician" chapter depicts the particular conception of expertise from the Tibetan medical perspective: a spectrum from mundane expert to perfected deity, such as the Medicine Buddha. At both MTK and SLL, it was often glossed as a handbook guide to becoming a great physician, a framework for one's developmental practices, mindsets to cultivate, and embodied paradigm to achieve. In these next pages, I present how the *Four Medical Transmissions* conceptualizes and instructs expertise through this important chapter, and how it is situated within the rest of the discourse on expertise in Tibetan medicine and diagnostic learning, as well as how it is described in class, in clinic, and integrated into the broader Buddhist perspective on expertise. In this section, I integrate ethnographic examples from conversations with mentors, as well as results from interviews and surveys administered to my teachers, classmates, and physicians at Men-Tsee-Khang (MTK), Sorig Loling (SLL), and in the Tibetan medical hospital in Xining. I connect and contextualize these responses within

other legendary examples of previous great physicians in recent history, my experience in developing the biography of a contemporary expert Amchi Yeshi Dhonden, and how understanding depictions of his expertise relates to that described in the *namtars* of the founders of our medical tradition—on one hand, though mythic, expert physicians and, on the other hand, fully realized examples: Yuthok Yonten Gonpo the Elder and the Younger, and other influential female examples such as Yeshe Tsogyal in relation to Guru Rinpoche.

Next, I discuss how cognitive neuroscience understands and investigates expertise. I examine expertise in the domains most relevant to Tibetan medicine: memory, perceptual skill, reading and performance. Subsequently I return to our earlier discussion of Dharmakīrti, revisiting his approach to *pramāṇa* theory and how it relates to expertise. Throughout this chapter, I discuss how "becoming a physician" is synonymous with "becoming diagnostic tool." As blueprinted in the chapter "Activities and Qualities of the Physician," I describe the process as simultaneously cultivating proper perception of reality and the capacity to do so, while also developing the *purpose* vis-à-vis compassion training to direct that means of knowledge to be more effective at recognizing the causes of suffering and the means to eliminate that suffering. The key aspect of this "becoming" is the preparation of the vessel, namely the mind-body of the physician to become a better diagnostic instrument. This is what these practices provide. I intersperse ethnographic vignettes of my own experiences observing and learning from great physicians in action.

Expertise as understood by the Tibetan medical tradition: defining an expert

At Men-Tsee-Khang, just as at Sorig Loling, my teachers described the great expert doctors[437] on the mundane level as well as supramundane similar to *namtar* descriptions and ideals of fully enlightened entities, namely the Medicine Buddha and emanations thereof such as Yuthok Yonten Gonpo. The contemporary biographies of renowned senior physicians these days often begin with a notation of when the physician first memorized the *Four Medical Transmissions*. This standard of completing the memorization of the text is considered the foundation upon which all other understanding —theoretical and practical—stems. It is a gateway point in the education of a Tibetan physician. Moving through this gateway provides access to any further understanding. The next notation in a contemporary biography details that the physician gained complete understanding of the text through familiarization of numerous commentaries and understandings, and with which teachers they gained oral instructions, usually listing by name any renowned teachers with whom they studied. A great physician is presumed to be comprehensively adept at diagnostics, so unique skill in this area is rarely mentioned.

The next major qualification conferring expertise is the lineage to which the physician belongs. Lineage provides a level of expertise—both nascent and fully manifested—that can only arise from a specific type of belonging. In fact, it is presumed that the same medicine given by two different *menpa* to the same patient will likely have different effects since the two *menpa* differ in their individual skill in imparting blessing to the medicine—skill derived from both the curricular studies and clinical experience as

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[437] སྨན་པ།

well as accomplishment in Buddhist practice and belonging to a specific lineage. Lineage can derive from one's blood family, as when one's ancestors, particularly of the paternal line, are all physicians. The second form is the spiritual family as a student of a great lineage of physician practitioners, for which, in many cases, a fused conception of Buddhist and medical lineage arises, and in others, the medical lineage and the Buddhist lineage are distinct. This occurred for many at Lhasa Mentsikhang, and does today for D'asa Men-Tsee-Khang, in that one's medical teachers may be from a separate Buddhist lineage than one's root teacher. However, everyone integrates some of their Buddhist and medical lineage by participating in our nonsectarian rituals and practices daily and monthly as a school and medical institution.

The development of expertise arises from a form of auto-pedagogy that draws upon a foundation of textual inculcation with extensive clinical experience and integrates lineage participation, mentor emulation, and Buddhist-medical integrated practices applied through a particular conceptualization of compassion framing one's purpose and responsibility as a Tibetan physician. In this auto-pedagogy, students are prepared for and expected to engage in a lifetime of this skill development to attain expertise. The capacity to imbue the same medicine with a particularly stronger differential potency depends on the individual's achievement in Buddhist practice and realization[438], as well as their theoretical and practical knowledge of Sowa Rigpa—the depth of their experience in all these facets. In many ways, both the realization from their Buddhist practice and the practical aptitude in medicine is jointly fused in their embodied knowledge, and their

[438] This can also clearly be Bön practice (Dietschy 2016).

ability to impart this embodied knowledge as healing insight and capacity to the patient is a measure of a great physician.

Theoretical basis for expertise in the Four Medical Transmissions

The final chapter of the *Explanatory Transmission* "Activities and Qualities of the Physician" contains six sections: (1) the six qualities to be cultivated, called the "causal basis of a physician;"[439] (2) the essence of a physician[440]; (3) the definition of physician[441]; (4) the categories of physicians[442]; (5) the activities of a physician[443]; and (6) the accomplishments of a physician.[444] Since the second and third headings are more succinct, comprising only a few stanzas each, I will address them first. They also contextualize the content of the other headings. The essence of a physician uses the term *ngo-wo*[445], which can refer to the identity, intrinsic nature, character, or innermost principle of a given entity. Here, the chapter reads, "The 'essence' of a physician is someone who fully internalizes the definitional characteristics of the *nyépa*, that which is harmed, and the antidotes" (TII, Ch 31: 196). The *nyépa* is that which causes harm; that which is harmed is the body and its constituents[446], and that which is an antidote is any

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[439] སྨན་པའི་རྒྱུའི་བསྟན་པ།

[440] སྨན་པའི་ངོ་བོ་བསྟན་པ།

[441] སྨན་པའི་རིགས་ཚོག་བསྟན་པ།

[442] སྨན་པའི་དབྱེ་བ་བསྟན་པ།

[443] སྨན་པའི་ལས་བསྟན་པ།

[444] སྨན་པའི་འབྲས་བུ་བསྟན་པ།

[445] ངོ་བོ།

[446] ལུས་ཟུངས་བདུན་དང་དྲེམ་གསུམ།

entity that repairs, relieves, or eliminates harm. The term *ngo-wo* is important here because it provides both a form and function to the physician. All enlightened deities, despite their numerous forms and activities retain the same essence (*ngo-wo*): *bodhicitta*, an enlightened mind. Thus, Yuthok Yonten Gonpo is seen as a manifestation of the Medicine Buddha because of his identical essence to the Medicine Buddha, an enlightened mind and all the accompanying capacities. Similarly, this conception of a physician retains this identical essence: a *menpa* is someone who has trained fully in the agents of harm, the objects harmed, and how to prevent and repair such harm. Here, we see the scope of what it means to be an expert physician broaden across both medical and spiritual modalities, and broaden from mundane to supramundane understandings of expertise.

When teaching these stanzas, Gen Tenchöe foreshadowed the section in the final two chapters of the *Subsequent Transmission,* reminding us that the domain of education for the physician was any field of knowledge that accomplished these goals. We had not studied these last two chapters that completed the entire *Four Medical Transmissions* yet, but we were becoming familiar with its capstone content.[447] As Gen Tenchöe described the text states, "Although the compassion of the Buddha is unbiased and unwavering towards all beings, individuals perceive him in different forms due to different temperaments and inclinations. Just as there is only one moon shining in the sky and we perceive the moon in every ladle of water; the Buddha taught in only one language, yet it is heard differently by different listeners" (TIV, Ch 26:759). Because the same form for

[447] Gen Tashi Dhondup at SLL did refer back to these stanzas when he taught our class covering those final chapters.

individuals exists everywhere—both in mind and body, so medical knowledge may look different across countries, peoples and traditions, but will have the same essence. Any medical system that provides healing and protection from harm is part of Tibetan medicine and should be part of the domain of knowledge for a physician to know.

Gen Tenchöe described how the patient and physician are also related through the merits and imprints of previous lives and the interdependent matter of which they are constituted[448], and the role of directing intention to care for the patient. As the text describes, "For the unknowledgeable, studying medicine is a method of acquiring knowledge. Through this method, one may balance the [psychophysical] collections. Through this balance, one achieves health and happiness. Hence, the method and the goal are related, corresponding to their dependence on meaningful action" (TIV, Ch 27:763). Here, 'meaningful action' relates back to 'enacting purpose,' *dön-ché*[449] as we saw with *arthakriya* in Dharmakīrti's description of how purpose distinguishes the perceptual content to which we attend and the related derived inferences. In this section, Gen Tashi Dhondup explained this as benefiting others, the greater purpose of relieving all suffering. He explains that meaningful action can only arise from a properly prepared vessel. As described later in the chapter, he says, "An unsuitable vessel will not be able to retain the essence of the teachings. Similar to putting white lion's milk in an ordinary container, which is not precious, not only will the container break, but the essence of the

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[448] As reflected in our previous discussion on ontology, the chapter continues, "The body is generated by the four elements, just like the object to be healed is generated by the four elements. Likewise, medicine—the antidote to be applied—has the nature of the four elements. Body, illness, and antidote, and one's self are all identically related. The basis of affliction and that which afflicts are related like the base and its dependent relations" (TIV, Ch 27: 762).

[449] དོན་བྱེད།

milk will also spill." This section continues by enumerating the qualities of unsuitable vessels from which the knowledge of healing should be kept secret at all cost—even risking the knowledge itself being lost over time (TIV, Ch 27:766). It reiterates that which is described in the "Activities and Qualities of the Physician" but from the perspective of the suitability of one's vessel. The chapter describes that a suitable vessel is one who will hold one's teacher with utmost respect, supreme over all; will be generous in giving away wealth and even life without feeling loss; one who is highly intelligent and able to distinguish the words and meanings of the text; one who is kindhearted and holds others' benefit as of utmost important; those committed to Dharma; those who are not cunning or deceitful, and those who possess all six qualities of the physician" (TIV, Ch 27:766). As did my classmates at MTK, we were required to memorize this section in full in our final semester at Sorig Loling.

The third heading in the chapter "Activities and Qualities of the Physician" on the definition of a physician uses the term *ngé-tsik*[450], which provides a contextual etymology of the term *menpa*. "The definition of a *menpa* is someone who cures illnesses and benefits the body, who heroically conquers illness through treatment and saves all beings like a compassionate father; and who all kings honor as the greatest" (TII, Ch 31:196). *Menpa*[451] literally means to benefit, a synonym for the verb *penpa*[452], used most often

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450 ངེས་ཚིག

451 སྨན་པ།

452 ཕན་པ།

when describing benefitting others. Even the term for medicine, *men*[453], denotes this meaning of simply benefitting others. Here we also see the broad spectrum of physicians: from someone who is competent at treating illnesses to a legendary hero providing limitless benefit for all.

The six qualities to be cultivated, or the "causal basis of a physician," provides a personal development directive for the developing physician as well as expectations for qualities he or she must embody. As one of the MTK faculty described it, "It is the best method in becoming a complete physician."[454] It contextualizes the latter section presenting the different categories of physicians—a wide spectrum from the poor to the unexcelled—and the qualities attributed to each category. Many of the characteristics are similar to what one would expect for a great physician. I will not address all of these characteristics, focusing instead on factors related to expertise in embodied knowledge, and how one is expected to gain such mastery.

As described in the previous chapter regarding the preliminary practices that prepare the body and mind of the physician for proper urine and pulse analysis, the chapter on physician's conduct also provides instructions on the embodied aspects of skill cultivation. Specifically, the chapter enumerates six qualities an eminent physician must have: intelligence, compassion, commitment, dexterity, diligence and proficiency in social ethics. Intelligence includes being broad-minded[455], having stability of mind[456],

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[453] སྨན།

[454] ཉམས་ལེན་བཟང་ཞོས་ནི་རྒྱུད་ནང་གསུངས་པའི་སྨན་པའི་རྒྱུ་བོ་དག་ཡིན་ན་དེའི་ནུས་པ་ནི་རང་ཉིད་ཚོང་བའི་སྨན་པ་ཞིག་ཏུ་འགྱུར་ཐུབ།

[455] བློ་ཆེ།

[456] བློ་བརྟན།

and displaying a discerning mind[457] (TII Ch 31:191). Of the six qualities, intelligence is considered supreme.[458] Here we see a similar understanding of stability and discernment in mind. It allows for the instrument of the physician himself to discern characteristics of the patient for diagnostic purposes and allows for a focused, undistracted mind in doing so. This approach blends the psychological and physical into one seamless whole of knowing.

This section also describes an orientation that the physician should cultivate: the medical knowledge as sacred, one's teachers as eminent, one's fellow students as spiritual friends, one's patients as one's own children, and one's medicines as life-giving nectar. This developed perspective also fosters a distinctive ethical stance. Such an orientation facilitates a reverence for one's work and a comportment in one's profession that imbues action with attentiveness, care, and commitment to excellence (TII, Ch 31:191-2). Saba Mahmood describes a similar transformation via such an orientation and comportment in *Politics of Piety* (2005) that imbues women in the Muslim community of Egypt with an authority and respect due to their embodiment of the knowledge and practices fused into one as a comportment of their disciplined bodies. The *Four Medical Transmissions* takes this orientation further by having the physician visualize one's self as the Medicine Buddha with all the proper qualities, knowledge, skill, instruments, capacities and so forth. This is also seen for the physician for a multitude of practices, two of which we will cover more in depth later in this chapter: Medicine Buddha and Yuthok Nyingthik.

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[457] བློ་གཉེག

[458] དེ་ལ་དང་པོ་བློ་དང་ལྡན་པ་ནི། བློ་ཆེ་བློ་བརྟན་བློ་གཉེག་གསུམ་ལྡན་པས། གསོ་དཔྱད་མངོ་རྒྱས་ཆུས་ལ་ཡུས་ཟོང་དུ་ཆུད། ལྷག་ལེན་ཀུན་ལ་ཐོགས་བརྟགས་ཉམ་ངེད། རིག་པས་དཔྱོད་ཤེས་མངོན་ཤེས་ཐུགོ་འཚར། དེ་ཉིད་རྒྱུ་ཡི་ནང་ནས་མཆོག་ཅེས་བྱ། (TII, Ch 31: 191).

The reverence one cultivates extends to the medical instruments employed as well as the medicine administered. The former should be viewed as weapons of liberation like the hand implements of sacred protectors and deities. The medicines themselves should be viewed as elixirs and wish-fulfilling jewels that grant the patient not only wellness but full enlightenment. Such a perspective cultivates a therapeutic relationship between physician and patient as well as between the physician and the therapeutic modality. In the Tibetan medical tradition, an expert, or *khépa*[459], can maintain such a mental state and perspective throughout his or her therapeutic relationship with the patient. This is one of the great hallmarks of an expert, and is said to provide diagnostically rich data and strong therapeutic efficacy. This perspective extends to the compounding and consecration of the medicine, where the physician should "Visualize the medicine as nectar and the container as the Buddha's begging bowl filled with nectar" (TII, Ch 31:193).[460] The visualization extends to eliminating all imbalances of the three *nyépas* and all disease arising from the three mental poisons.

The chapter specifies that the great physician is "well-versed in the eighteen supreme knowledges."[461] The eighteen supreme knowledges have several glosses according to Wende Tsering (2011), who edited and compiled the textbook to this section of the *Four Medical Transmissions* in the textbook series. He writes, "There are many accounts from the great masters of the past in terms of enumerating these eighteen great

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[459] མཁས་པ།

[460] གཉིས་པ་ལེགས་པར་སྦྱར་ལྟབྱིན་ཐིས་བརླབ། རང་ཉིད་བཅ་ཀུ་རྟ་འོད་རྒྱལ་བོ་དང་། སྨན་ཕྱི་སྡོང་ནི་ཡིད་བཞེད་བསམ། སྨན་ཁུ་དང་སྲོང་རྟམས་ཀྱིས་ཤིས་པ་བརྗོད། (TII, Ch 31:193).

[461] རིག་པའི་གནས་མཆོག་བཅོ་བརྒྱད།

knowledge fields" (76). In the *Blue Beryl*, Desi Sangye Gyatso quotes the *Revelation of the Scriptures of Vinaya*, the four texts on disciplinary conduct prescribed by the Buddha for monastics. The text glosses the eighteen supreme knowledges as: secret mantra tantras; detailed *sādhanas* and ritual practices; dialectics, logic and reasoning; Vedic and pre-Buddhist scriptural knowledge; grammar and linguistics; syntactical structure; clear wisdom; contextual etymology; extractions and metrical collections; astronomy and astrology; epistemology; yogic philosophy; greater conduct; worldly Charvaka (nihilist) philosophy; Vaishesika philosophy; knowledge of the sixty transmigrations; field of annexation; and abiding-sustaining philosophy.[462] He then describes the eighteen fields of knowledge as characterized by Vasubandhu in the *Abhidharmakośakārikā*, *Verses on the Treasury of the Abhidharma*[463]: music, sexual intercourse techniques, life calculations, enumeration, grammar and linguistics, medical arts, commentarial tradition within the Buddhist schools, craftmanship and technology, archery techniques for hitting the target, reason, yogic meditation, erudition and receiving oral teachings, mindfulness (*smṛti*), astrological analysis, magical display, history, and causality.[464] Jamgön Kongtrul Lodrö Tayé enumerates the knowledge fields as follows: articulation and semantics, Sanskrit

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[462] གསང་སྔགས་ཀྱི་རྒྱུད་དང་། ཚོ་གཞིབས་མོ་དང་། གཏན་ཚིགས་རིགས་པ་དང་། རིག་བྱེད་དང་། བརྡ་སྤྲོད་པ་དང་། སྒྲ་དེས་པར་སྨྲོར་བ་དང་། ཤེས་རབ་གསལ་བ་དང་། དེས་པའི་ཚིག་དང་། ཉེ་བསྡོམས་པ་དང་། སྐར་མའི་རིགས་པ་དང་། རྟོག་བྱེད་ཀྱི་རིགས་པ་དང་། ཆུར་ལྟུང་གི་རིགས་པ་དང་། ཆར་སྨྲོད་ཀྱི་རིགས་པ་དང་། འཇིག་རྟེན་རྒྱང་འཕེན་པའི་རིགས་པ་དང་། བྱེ་བྲག་པའི་རིགས་པ་དང་། རྒྱུད་དྲུག་རྩ་པའི་རིགས་པ་དང་། ཁྱོར་མེད་ཀྱི་རིགས་པ་དང་། གཞས་འདུག་གི་རིགས་པ་སྟེ་བཅོ་བརྒྱད་ཏོ་ལ་བྱང་བར་ཐྱོར་ཏོ།

[463] Written by Vasubandhu in the fourth or fifth century.

[464] རོལ་མོ། འཕྲིག་ཐབས། འཚོ་རྩིས། གྲངས་ཅན། སྨན། གསོ་དཔྱད། ཚོས་ཡུགས་ཏེ་ཡུགས་ཀྱི་བསྟན་བཅོས་ལྟ་བུ། བཟོ། གཞུའི་རིགས་པ་སྟེ་འཕོངས་དཔྱད། གཏན་ཚིགས། རྣལ་འབྱོར་ཏེ་བསྒོམ་པ། ཐོས་པ། དྲན་པ། སྐར་མའི་དཔྱད། རྩིས། མིག་འཕྲུལ། སྟོན་ཀྱི་རབས། སྟོན་འབྱུང་བཅས། བདུད་རྩི་བསེ་བརྒྱད་ལས།

grammar, logic, fine arts, medicine, astrology and divination, poetics, prosody, synonymies, dramaturgy, mundane spiritual paths, and the exalted vehicle (2013).

The chapter describes skills in dexterity for physical, verbal, and mental skills. Expertise in physical skills requires excellence in plant identification, preparation, and compounding medicine. It also requires proficiency in forming medical instruments, such as forging surgical scalpels out of metal, sculpting metal tubes for paracentesis, shaping bull horns and copper cups for therapeutic suction, preparing needles for diverse therapeutic needle applications, and so forth. Excellence in verbal skills requires an ability to speak with the patient in such a way that cultivates a joyful attitude in the patient. Mental dexterity implies a radiant mind that clears obscuration and allows the physician to astutely understand the causes and conditions affecting the patient.

The chapter continues to delineate a determination and persistence that characterizes an expert: a diligence in seeking all means to assist the patient in healing; staying well-read, well-informed and abreast of relevant knowledge to the diagnostics and treatment of patients; and seeking great mentors from whom to continue learning, doing so with complete dedication and earnestness. The chapter emphasizes the importance of humility and living a non-materialistic, compassionate and exemplary life. It explains the importance of a collegial engagement of stimulating discussion and debate to constantly progress in learning. It details a continual familiarity with medical practice so any procedures are done with aesthetic grace and optimum outcome.

Finally, it specifies a commitment and practice to understanding social ethics of the mundane world as well as achievement in great spiritual practice. The text classifies

physicians into three ranks: the ordinary, extraordinary and unsurpassed. The unsurpassed physician can treat all disorders comprehensively from the root causes in the three mental poisons. This category of physicians would be considered fully enlightened, such as the Buddha himself, and all his emanations. As described above in the discussion on *namtars*, these are ideals for which to strive, not necessarily practical delineations for a group of one's colleagues. The extraordinary physician is said to have a clairvoyant mind and be so compassionate so as to rectify their own defects of body, speech and mind such that all the imbalances of others are harmonized. This provides an interesting window into a specific healing ontology in which the condition of the body, speech, and mind of the physician himself is seen as therapeutically beneficial. This group of physicians is considered similarly excelled in their realization. Not fully enlightened but advanced in their achievements on the path toward full realization. The ordinary physician is beneficial to all suffering beings. So even his stature might be considered superior by conventional standards. Again, these are ideals for which to keep in mind as motivating models, not actual delineations to categorize today's physicians.

Among ordinary physicians, the chapter further categorizes physicians as supreme and inferior where the supreme physician is intelligent, loyal and committed; has a genuine medical lineage; is well-versed in medical theories; is skilled in employing instructional therapeutic approaches; is well-acquainted with all practical applications; is fully devoted to spiritual practice and thus has forsaken sensual desire; is serene; skilled in producing medicines and making medical instruments; is compassionate to sentient beings; has unwavering devotion to others' needs and considers others' needs as one's

own; and is not ignorant to aspects of medical theory or practical approaches. The supreme physicians are considered emanations of the Medicine Buddha himself.

From the lofty ideals of the superior physicians, my survey responses provided a more practical model of categorizing physicians. Expert physicians were described as those who had gained mastery over both medical and Buddhist practice. The next category below, the very good physicians, are those who make comprehensive use of medicine knowledge and practice but are not as excelled in Buddhist practice. And one rank below, the good physicians, are those who have comprehensive understanding of both theory and practice in Tibetan medicine. This provides a more practical model of how physicians are categorized within the actual field. The contemporary living experts identified[465] were depicted in exemplifying expertise across a wide range of knowledge and practice: full root and commentarial textual understanding, frequent individual

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[465] The following are some of the contemporary experts identified: Karma Tsokni (often named), Gatüb Tsering, Sonam Tseten, Jentsa Aku Tamchöe (often named), Alak Jamyang, Jamtso, Tangdzin Tsering (often named), Sokdzong Tensung Drakpa (often named), Lobsang Nyima (often named), Gen Wangdue, Dragya, Dondrub Tsering, Namlhakhar, Pema Wangdrag, Tamdrin Gyal, Tsuntarjial (ཀན་ཆོས་གཉིས། དབའ་ཐུབ་ཆོ་རིང་། བསོད་ནམས་ཚེ་བརྟན། གཅན་རྫ་ཙ་དམ་ཆོས། ཨ་ལག་ལ་འཇམ་དབྱངས་ལག་ཚང་། མགོ་ལོག་ཙ་ཀུ་ཉིད་འཕྲོན། འཇམ་ཚོ། སོག་རྩོད་བརྟན་སྡུད་གྲགས་པ། རྒྱ་ཡེ་བློ་བཟང་ཀྱི་མ། བསྟན་སྲུང་གྲགས་པ། རྟ་མགྲིན་རྒྱལ། འཕགས་མེད་ཕུན་ཚོགས། བཀྲ་རྒྱ། དོན་གྲུབ་ཆོ་རིང་། གནམ་ལྕམ་ཁར། ཁང་ངམ་དབང་གྲགས། ཉིད་འཕྲོན་ཆོ་རིང་། རྟ་མགྲིན་རྒྱལ། ཁྲི་ཀ་བཙུན་ཕར་རྒྱལ།). The following are some of the very good physicians (སྨན་པ་ཞེ་དགས་ཡག་པོ།) identified: Gen Wangdue, Jentsa Aku Tamchöe (often named), Tamdrin Gyal, Jigme Phuntsok, Namlhakhar, Dawa Ngodrub, Dondub Tsering, Lushamjial, Nyima Tsering, Tsedra, Rigzin Dorje, Dukar Tashi, Tsokyi, Lobsang (དབང་འདུས། གཅན་ཙོ་ངམ་ཆོས། རེབ་གོང་རྟ་མགྲིན་རྒྱལ། རེབ་གོང་འཕྲིགས་མེད་ཕུན་ཚོགས། གནམ་ལྕམ་ཁར། ཟླ་བ་དངོས་གྲུབ། དོན་གྲུབ་ཚེ་རིང་། ཀླུ་བྱམས་རྒྱལ། ཉི་མ་ཆོ་རིང་། ཆོ་ཀུ། རིག་འཛིན་རྡོ་རྗེ། གཏུགས་ཀ་ཀར་བཀྲ་ཤིས། འཚོ་སྐྱིད། ཐོ་བཟང་)). Good physicians identified include: Gen Namlhakhar, Dondrub Tsering, Ogyen, Togya Drukjamkhar, Tsuntarjial, Gatüb, Tsokyi, Khabumjial (གནམ་ལྕམ་ཁར། དོན་གྲུབ་ཚེ་རིང་། ཨོ་རྒྱན། ཐོ་རྒྱ་སྐྱབ་ཁ། བཙུན་ཕར་རྒྱལ། དཀའ་ཐུབ། རེབ་གོང་འཚོ་སྐྱིད། འབའ་གཞུང་མཁའ་འགྲམ་རྒྱལ། ཐོ་རྒྱ་འབྲུག་ཀྱམས་མཁར།). Primary དགེ་བའི་བ-ཤེས་གཉེན། medicine teachers identified include: Troru Tsenam, Lobsang Gyatso, Tashi Rinpoche, Gen Ngawang Tenzin, Gen Tamdrin Gyal (often named), Malho Sozdzong Jamyang, Gen Gatüb Tsering, Lobsang Nyima (often named), Gen Wangdue, Gen Jamyang Lhundrub, Jigme, Samgrub Gyal, Namlhakhar, Dondub Tsering (ཁོར་རྩེ་རྣམ། བློ་བཟང་རྒྱ་མཚོ། བཀྲ་ཤིས་རིན་པོ་ཆེ། རྐན་དབཀ་དབང་བསྟན་འཕྲིན། རྐན་རྟ་མགྲིན་རྒྱལ། ཚ་རྩེ་ཁོག་རྩོད་ཙ་ཁ་འཁྲབ་ཁང་། རྐན་དཀའ་ཐུབ་ཆོ་རིང་། རྐན་བསྟན་བཟང་གྲགས་པ། རྒྱ་ཡེ་བློ་བཟང་ཀྱི་མ། རྐན་དབང་འདུལ། རྐན་འཇམ་དབྱངས་ལྷུན་གྲུབ། འཇིགས་མེད་ཕུན་ཚོགས། བསམ་གྲུབ་རྒྱལ། གནམ་ལྕམ་ཁར། དོན་གྲུབ་ཚེ་རིང་།)

authorship of commentaries, excellence in diagnostics, medicine compounding, and teaching; some were mentioned to have developed their own formulas; excellence in Tibetan language skills, and comprehensively, mastery in Buddhist practice. In looking at the responses of my mentors and senior physicians, however, only those who had gained an early monastic education had formal education in classic Buddhist texts[466], as well as indicated more extensive practice and engaging in retreat.

In the "Activities and Qualities of the Physician" chapter, the inferior physician is characterized by various potential weaknesses that confer his substandard status. The weaknesses are described in the form of analogies to emphasize the dangers of lacking qualities, skills, and capacities important to the identity and work of a physician. They are known as the thirteen faults of the inferior physician. For example, the text says, "A physician without an authentic lineage resembles a fox on a king's throne. He will not be honored by anyone" (TII, Ch 31:197).[467] The importance of a medical lineage is explicit here. A medical lineage means that one has learned the medical theory and practice from a trusted teacher who has a lineage going back to Yuthok Yonten Gonpo the Younger himself. Without proper lineage, it is assumed that, first, one did not receive proper instruction on the nuances of the medical practice and, second, one has less realized capacity and ability to confer therapeutic efficacy. Both of these qualities are considered important to a Tibetan physician. This section of the chapter continues: "He who is ignorant of the meaning of the medical treatises is like someone showing an object to a

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[466] Texts studied included Collected Topics, *Pramāṇa*, Six *Pāramitās*, *Great Lamp on the Path to Enlightenment, Bodhicaryāvatāra*, mind training (བློ་སྦྱོང་), *Abhidharma*, and *Vinaya*.

[467] དེ་ཡང་མི་ལྡན་ཐམའི་སྐྱོན། རིགས་རྒྱུད་མེད་པའི་སྨན་པ་དེ། ཕ་ཡིས་རྒྱལ་བཟུང་བ་ལྟར། ཀུན་གྱིས་གྱི་བོར་བཀུར་མི་འགྱུར། (TII, Ch 31:197)

person who was born blind. He will neither be able to identify the particular disorder nor will he be able to differentiate [the benefit of] different therapeutic approaches" (TII, Ch 31:197).[468] Here the chapter is imploring physicians to study the texts well and thoroughly imbibe the contents to become proficient.

However, the text also emphasizes the importance of diagnostic experience. "A physician who is not acquainted with the experience of seeing patients is like someone traveling on an unfamiliar road. They will face doubts concerning the signs and symptoms of a disorder and its treatment"[469] (TII, Ch 31:197). In this stanza, we see the warning to physicians who are only learned in the text itself. These days we do see many physicians who graduate with minimal clinical experience and then travel abroad where they are asked to see patients. This is a warning to the error of assuming one can impart effective practice without proper clinical experience.

One of the most frequent responses on my surveys with mentors and senior physicians regarding the method to gain proficiency in pulse analysis is to see numerous patients with numerous kinds of conditions. Such experience will enliven one's understanding of the text. Many also indicated the importance of visualizing the *nyépa* pathways in the patient and how they relate to environmental, social, seasonal, and mental influences that shift them.

"A physician who does not know about the correct methods of diagnosis is like someone wandering in a foreign land without any acquaintances. There will not be a

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[468] གཞུང་དོན་མི་ཤེས་སྨན་པ་དེ། དམྱས་ལོང་དག་ལ་རྩ་བསྟན་བཞིན། ནད་རིགས་བཅོས་ཐབས་ཤན་མི་ཕྱེད། (TII, Ch 31:197)

[469] མཐོང་གོམས་མེད་པའི་སྨན་པ་དེ། རྒྱུས་མེད་ལམ་དུ་ཞུགས་པ་བཞིན། ནད་རྟགས་དཔྱད་ལ་ཐེ་ཚོམ་འཚུར། (TII, Ch 31:197)

single disorder that he knows”[470] (TII, Ch 31:197). In this analogy, we see the role of diagnostic methods in contributing guideposts to uncovering the identity of the illness. The analogy provides further insight to the role of various diagnostic methods through illustration of the analogy.

“A physician who does not know pulse diagnosis and urine analysis is like a messenger at war who does not know how to convey the correct message. They will not be able to give the correct identification of hot and cold disorders”[471] (TII, Ch 31:198). In this analogy, we see the use of pulse and urine as messengers, providing clarification particularly of the hot and cold nature of the disorder through the metaphor of communication. The other forewarnings of an inferior doctor are also described through analogy. For space constraints, I will enumerate them here without analogy. He is not able to make a correct prognosis; does not know the therapeutic principles properly and does not apply proper remedies. He does not have knowledge of diet and lifestyle and often aggravates the disorders and destroys the bodily constituents; he does not know how to compound pacifying medicine and gives rise to additional disorders consequently. He does not know how to employ evacuative therapies and can aggravate a disorder and ruin the bodily constituents simultaneously. He is without medical instruments and medicines and unable to conquer the illness. He does not know how to perform venesection and moxibustion, making mistakes in performing the external therapy that corresponds appropriate to the nature of the disorder; and is incompetent in every aspect of medical

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[470] བརྟག་ཐབས་མི་ཤེས་སྨན་པ་དེ། གཉེན་མེད་བྱེས་སྤྱ་འཁྱམས་པ་འདྲ། ནད་ངོ་ཤེས་པ་གཅིག་མི་འཚྲུང་། (TII, Ch 31:197-8)

[471] རྩ་རྩུ་མི་ཤེས་སྨན་པ་དེ། བྱ་པས་བྱ་གཏོང་མི་ཤེས་འདྲ། ཚོ་གྲང་ནད་ཀྱི་སྐད་མི་སྡེར། (TII, Ch 31: 198)

knowledge and ultimately gives incorrect treatments, hence becoming a threat to the life of the patient.

In the section on "Diagnosing through Indirect Skillful Means" (TII, Ch 25), the *Four Medical Transmissions* describes the usefulness of being able to diagnose through a single modality, or even more so, "by a mere glimpse" of the patient (168). This capability is heralded as a skill only the great doctors can command, similar to the stories I mentioned earlier of Amchi Yeshi Dhonden. This is the type of legend that builds on the textual basis for expertise when the text says that those physicians who can diagnose by a single diagnostic method, as in a mere glance, will gain renown appropriately by doing so[472] (TII, Ch 25). Those who are adept at rigorous application of diagnostics will also be considered experts, but greater value is placed on the impressive use of a single diagnostic mode (Samdrubgyal 2010). My mentors frequently explained the importance of thorough diagnostic assessment of the patient through all possible means and objects of diagnosis, and commented that such thorough knowledge combined with realization in Buddhist practice would produce these impressive skills. It was understood that one needs various other characteristics as well: the proper lineage, elimination of karmic obstacles, and discipline as well.

The section on the activities of a physician in the chapter "Activities and Qualities of the Physician" delineate common activities and particular activities. The common activities describe physical, verbal, and mental actions of a physician — the physical

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[472] སྨོ་ལ་གདོན་པ་ཐབས་ཀྱིས་རྟོག་སྐྱར་ན། གཞན་དག་རྩ་རྒྱུས་ལས་བརྟག་དགོས། ངལ་མ་ཡིན་གཅིག་ལ་ཁར་དམར་གདགས། མིག་བལྟས་ཙམ་ཀྱིས་ཆོག་ཅེས་བྱགས་པ་འབྱུང་། ཡང་ན་ཞིབ་ཆུ་དཔྱད་པས་བརྟག་མཁས་ཟེར། (TII, Ch 25)

actions of preparing medicine and medical instruments; the verbal actions of providing prognoses and proper diagnostic articulations, as well as reassuring the patient and using skillful speech to manage outcomes; and the mental activities of diligently learning the medical knowledge and practiing its obligations with attentiveness and astute discernment.

The particular functions relate to the classic *dharmic* activities of correct view, meditation, and conduct. Correct view is detailed as gaining realization in the *Mādhyamika* view, and not falling into the extremes of nihilism, essentialism, or wrong view. Meditation is articulated as cultivating the four immeasurables of love, compassion, joy, and equanimity, and not falling into the four contrary reflections of loving those who are ungrateful, overdoing compassion to those who disrespect the *dharma* and hate sentient beings, feeling joy when a patient seen by another physician dies, and showing equanimity on whether a patient survives or dies. These latter four are specific to the view of a physician. Proper conduct is elaborated as abandoning the ten non-virtuous acts[473] and cultivating the six perfections—generosity, ethical discipline, patience, enthusiastic diligence, stable concentration, and wisdom.

The final section of the chapter "Activities and Qualities of the Physician" on the accomplishments of a physician are delineated into transient and ultimate rewards. The transient rewards refer to those of this life: happiness, power, wealth and prosperity, which are all benefits from understanding the medical knowledge. Thus, one is implored to impart this knowledge to others for their own benefit, and to do so with ease and

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[473] Killing, stealing, sexual misconduct,, lying, divisive talk, harsh words, idle talk, craving/coveting, ill-will, and wrong view.

affection even if one has received harm from a person. It instructs the physician to investigate thoroughly and give treatment confidently according to the patient's disposition. This brings the physician merit and renown. It also will confer prosperity in food and enjoyments to the physician. It also specifies to receive anything that is given by the patient for the service because it is given in remembrance of the kindness given. It instructs the physician not to receive anything after the passage of time since the patient will likely forget the kindness, changing the nature of the merit generated. The ultimate reward is described as enlightenment itself, since the physician has engaged wholeheartedly in the service of suffering patients, fully living by the purpose of benefitting others. This will confer the very transmogrification of the physician into an enlightened being itself.

Thus from causal characteristics to ultimate fruits, the spectrum of what it means to be a physician and the attainment of the highest ideal provides both mundane and supramundane perspectives on what it means to be an expert in Tibetan medicine. The generation of expertise becomes fully enfolded into the Buddhist path itself. This is the paradigm from which physicians engage in the auto-pedagogy of gaining clinical experience, inculcating the content of the texts, and training in the transformative practices of deity yoga, Dzogchen, as well as the component parts and distinct modes of compassion generation, contemplating the four immeasurables, and engaging in proper view and conduct. Form and function fuse as one insomuch as to become a physician is to transform into proper diagnostic tool. Methods of becoming are methods of diagnosis.

Clear vessel: refining body as means of refining diagnostic skill

Both in the pulse diagnosis and urinalysis chapters, the qualities of a physician chapter, and indications throughout the *Four Medical Transmissions*, the form of the physician's body-mind and the refinement of his or her physical, mental and sensory faculties are considered foundational to the development of expertise. As Dharmakīrti states, "So as to eliminate [one's own] suffering, the compassionate one strives to apply [to one's self] the methods [for doing so] because teaching the goal and its causes is extremely difficult for one to whom the goal and its causes are epistemically remote" [PV2.132, as quoted in Dunne 2006: 506). Many of the *tsa-rlung* yogic exercises are aimed at the cultivation of a clear body for undistorted realization of the nature of reality and enacting those realizations toward the elimination of suffering for all beings. Such practices are also integrated into higher trainings in the Medicine Buddha and Yuthok Nyingthik as well.

Our sensory experiences change with the condition of our body. As enacted cognition describes, the very materiality and capacities of our form determine the kinds of cognitions we can have.[474] Various practices refine the psychophysical aggregates, the materio-energetic complex of our body-minds for greater aptitude in realization and

[474] For example, our hearing ability changes with the levels of circulating estrogen in our bloodstream (Hultcrantz et al. 2006; Collins 2000; Birkhead 2012:49). This effect has been measured for women, but might occur to some degree in men as well. When estrogen levels are high, women tend to hear a man's voice as richer in sound. The effect is so subtle that most women do not notice the effect, but it may play an important role in mate choice.

diagnostic skill. The two sections on practices specific to Tibetan medicine at the end of this chapter describe the approach.[475]

Before getting to the sections on the transmogrification of the physician by specific practices, I will review the responses I received from teachers, mentors and classmates on their views of expertise, as well as particular considerations from *Four Medical Transmissions* commentators, and examples of the legendary figures of Tibetan medical history. Thereafter, I will discuss cognitive neuroscience on expertise, particularly the processes of developing expertise in domains relevant to diagnostic skill, the place for cultivating humanistic values, and the illustrative value of role-models in cultivating expertise.

Finally, I will discuss Dharmakīrti's approach to expertise in *pramāṇa* theory. I discuss how this approach provides a framework from which to understand how Buddhist practices act as vehicle for the transmogrification of physician into embodied diagnostic tool, relating to the practices and rituals critical to the development of expertise in Tibetan physicians, such as those of Yuthok Nyingthik and Medicine Buddha.

Expertise articulated by the great Tibetan medical scholars historically

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[475] In various traditions, particularly that of Dzogchen, pushing one's physiology and perception beyond one's accustomed limits is seen to generate a unique awareness (*rigpa* རིག་པ།) that fundamentally integrates the dynamics of mind and body (Baker 2012). Each tradition in Tibetan Buddhism has its own form of these *tsa-rlüng* practices seen to include, among its extensive salvific benefits, acute skill in sensory perception as well. A traditional account for the initiated has been recently translated (Callahan 2014 [Rangjung Dorje (13th century)]).

In his commentary of the *Four Medical Transmissions*, *Sage Advice of the Ancestors*, addressing the chapter "Indirect Skillful Means in Diagnosis" in the *Explanatory Transmission*, Zurkharwa describes the different conceptions of an expert during his era of sixteenth century Tibet (1992:577). He says,

> Those who are worthy of the title "expert *menpa*," must not only have produced exemplary written works from taking to heart the meaning of each word in the great canon completely, he must also have familiarized and thoroughly trained in all methods of diagnosis and treatment.[476] However, in these contemporary times, the everyday person will say that someone is a great physician simply [if that physician can] maintain individuals in a state of health, even if the physician has no knowledge of the medical canon and has only become known as an expert through treatments they learned through oral transmission. There are also physicians who are known for explaining the medical canon well but have no clinical skill. For those, even though initially they look like the Great Medicine King, they do not know how to provide explanations. […].[477] If one is famous without realization, one might boast of knowing profound aspects of all medical practice due to their appearance of providing benefit. However, I have seen the

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[476] དེས་ན་གཞུང་ལུགས་ཆེན་པོའི་ཚིག་དོན་ལ་ལུས་པ་ཁོང་དུ་ཆུད་པས་འཆད་རྩོད་སོང་རྩོམ་པ་ལ་མཁས་ཤིང་། ནད་བརྟག་ཐབས་དང་གསོ་ཐབས་གསོ་བའི་ཚུལ་ལ་གོགས་པའི་ལག་ལེན་རྣམས་ལ་གོམས་ཤིང་འདྲེས་པ་སྟེ། འདི་གཉིས་ཀ་དང་ལྡན་པ་ལ་སྨན་པ་མཁས་པ་ཞེས་བྱ་བར་འོས་ཤིང་རིགས་མོད། (Zurkharwa, *Sage Advice of the Ancestors*, Volume 1: 577-8)

[477] འོན་ཀང་དེང་གཅི་དུས་ན་སྨན་པ་གོ་དང་སྐྱེ་བོ་མཐའ་བྲལ་ཐ་མལ་པར་གཞན་པ་ཀུན་གྱིས་ཅིག་ཆར་དུ་འདི་ལྟར་སྨྲ་སྟེ། སྨན་པ་དེས་ནི་གཞུང་ལུགས་མི་ཤེས་ཀང་བཙོས་ཤིན་ཏུ་མཁས་གོ་ཞེས་པ་དང་། དེ་ལ་གཞུང་བ་ཤད་ཡོང་ཀང་ལག་ལེན་དོ་ཞེས་བྱ་བ་དང་། དེ་ནི་ནད་ཐོག་ཏུ་སྨན་པའི་རྒྱལ་པོ་ལྟར་ཡོང་ཡང་ཅང་ཤད་པ་མི་ཤེས་གོ་རིར་བ་ལ་གོགས་ཏེ་རི་བོང་གི་ཅལ་བཞིན་དུ་སྣ་ཚོགས་པར་སྒྲོག་ཅིང་འཕྲོད་པ་དང་། (Zurkharwa, *Sage Advice of the Ancestors*, Volume 1: 577-8)

> *Sowa Rigpa* teachings become more and more deteriorated through intrinsic [deluded] beliefs held by others.[478] […][479]

Today we see a similar concern as Zurkharwa identified in his time: physicians who have partial knowledge—theory without much practice experience, or some practical skill without rigorous theoretical knowledge. He describes the importance of deciphering expertise through comprehensive competency. He continues by describing the mode in which one applies theoretical knowledge into practical experience:

> [The chapter,] 'Indirect Skillful Means in Diagnosis,' [instructs that] one must first know the definitional characteristics of all illnesses. For all categories of illness, general and specific, one must know the symptoms, causes, conditions, modes of entrance, definitional characteristics, and so forth—how illness abides […] and how to recognize it. From thorough understanding of a patient's body, the mere pronouncement of the word "illness," can allow one to unmistakenly perceive how illness arises in that body because the illness's causes, conditions and so forth [have become] clear [through experience]. A master states, "This is this," from seeing many patients, [learning and] teaching the medical canon, and gaining familiarization. Intimate habituated knowledge is critical.[480] For

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[478] རྟོགས་ལྡན་དུ་གྱུར་པ་མ་ཡིན་ན་ཡན་ཐོག་ཆ་ལུགས་དེ་ཉར་ཚུར་པ་ཀུན་གྱིས་སྨན་དཔྱད་ཟབ་མོར་ཤེས་པར་སྦྱོར་ཞིང་ཐབས་སུ་ཆུད་པ་འདི་ནི་གསོ་བ་རིག་པའི་བསྟན་པ་ཆེས་ཆེར་ཉམས་པའི་ཡུས་དང་། (Zurkharwa, *Sage Advice of the Ancestors*, Volume 1: 577-8)

[479] རྒྱ་ཁམས་ཡངས་པོ་མ་མཐོང་བས་ཁ་མའི་གསང་གནས་ལ་བཅུད་མེར་བྱེད་པ་འམ། རྒྱ་མེད་ཀྱི་ཡུ་བ་ཤོས་འདོད་པ་འམ། དམྱལ་ལོང་གིས་རི་མོའི་རྣམ་དབྱེ་བཟོད་པ་དང་འདྲ་བར་ལུང་རིགས་ལས་འདས་པ་ཡིན་ནོ། (Zurkharwa, *Sage Advice of the Ancestors*, Volume 1: 577-8)
Although I have not seen the entire nation, performed a spectacle from [my] consort's secret place, longed for unceasing divine cake offerings, or acted as a blind person articulated the details of a drawing, I am someone who has gone beyond textual study and reason.

[480] གཉིས་པ་ཚིག་དོན་ནི། དང་པོ་ཤེས་པ་ནས་པར་ཡང་མིན་ཤེས་པའི་བར་ཀྱིས་བསྟན་ཏེ། དན་གཡོ་སྒྲིན་བརྟག་གི་ནད་ནས་དང་པོ་ནད་གང་ཡིན་ཀྱི་མཚན་ཉིད་ཤེས་པར་བྱ་བ་ནི། ནད་ཀུན་ཀྱི་སྤྱི་དང་ཁྱད་པར་ཀྱི་རྐྱེན་ཞུགས་ཚུལ་མཚན་ཉིད་སོགས་གོང་དུ་ནད་གནས་དང་། འོག་ནས་མན་ངག་རྣམས་བཤད་ནས་ལྷག་པར་སོར་འབྱེད་ཤེས་དགོས་པ་དེ་དག་གིས་ནི་ནད་པའི་ཡུས་ཀྱི་ཚ་ཤས་འདི་ཉ་བྱའོཞེས་ན་ཚ་ཤས་འདི་ལྟ་བུའོཞེས་ནི་ཚ་ཤས་ཀྱི་རྐྱེན་སོགས་བར་ཆད་མ་ཐག་ཏུ་ཆུད་ཟིན་ནས་ཁྱོད་ཀྱི་ལུས་ལ་ནད་འདི་ཡོད་ཅེས་ཁྱད་པར་དུ་འཕྱུལ་བ་ལྟ་བུ་ཞིག་ཏུ་ཤེས་པ་དེའི་ཕྱིར་ན་བ་ཤཐ་མ་ཐག་ཏུ་ཀྱི་རྐྱེན་སོགས་དང་། སློབ་དཔོན་ཕྱི་ནས། འདི་ནི་འདི་ཞེས་བྱ་བ་ལས་སོགས་པའི་སྒོ་ནས་ནད་པ་གསོ་བ་མང་དུ་མཐོང་བ་ལྟར་གཞུང་བ་ཤར་དང་ངོ་སྤྲོད་གཉིས་ཀ་ལ་གོམས་ཤིང་འདྲིས་པ་ནི་ཤིན་ཏུ་གཅེས་པ་ཡིན་ཏེ། (Zurkharwa, Sage Advice of the Ancestors, Volume 1: 577-8)

> example, knowledge of how to evaluate the quality of a precious gem, such as lapis lazuli (*baiḍurya*), [or valuable goods such as] porcelain, garments, scarves, horses, elephants, and medicine, [one must be able to recognize] the distinguishing characteristics, not only from what is taught in theoretically, but from one's [experience and ability in] seeing [such characteristics]. […][481]
>
> Integrated training is [critical and] internally resilient.[482]

This passage demonstrates Zurkharwa's view of the importance of both theoretical and practical knowledge as well as thorough familiarization from experience to qualify as an expert. He emphasizes thorough understanding of the characteristics of objects in the natural world (e.g., precious gems, animal species, medicine, objects and so forth) as well as one's practical experience in learning the perceptual characteristics of those objects. Here, he shows the importance of the conceptual-perceptual dialectic: trustworthy sources of understanding through textual knowledge from the treatises and perceptual acuity trained through proper cognitive engagement and experiential knowledge of the objects themselves.

The role of extraordinary ideal models

I was introduced to the merging of mundane and supramundane conceptions of expertise that the *Four Medical Transmission* depicts when I was exposed to the genre of *namtar* on a more personal level at the beginning of my medical education. Kelsang

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[481] དཔེར་ན་བཻ་ཌཱུརྱ་ལ་སོགས་པའི་རིན་པོ་ཆེ་དང་། ལ་སོགས་པའི་ཁོངས་ནས་དཀར་ཡོལ་དང་གོས་དར་སོགས་སམ། རྟ་དང་། གླང་པོ་དང་། སྨན་ཡུལ་ཞི་བཟང་ནང་ཤེས་པར་བྱ་བ་དེ་འང་ས་སོའི་མཚན་ཉིད་སྟོན་བྱེད་ཀྱི་བསྟན་བཅོས་ཁོ་ན་མཐོང་བས་ཀྱང་རྟོགས་པ་མ་ཡིན་ཞིང་། (Zurkharwa, Sage Advice of the Ancestors, Volume 1: 577-8)

[482] བསྟན་བཅོས་དེ་མེད་པར་མཐོང་བ་བརྒྱུད་པའི་ངོ་སྤྲོད་ཁོ་ནས་ཀྱང་མཐའ་མི་ཆོད་ཅིང་། ཇི་ལྟ་བ་ཁོང་དུ་ཆུད་པར་ནུས་པ་ཡང་མ་ཡིན་པ་དེས་ན་འདི་ཀའི་སོ་གང་ཡང་རུང་བ་ཞིག་མེད་ན་མཁས་པ་མི་འབྱུང་བས་རྒྱུ་འཕེལ་དུ་བསླབ་པ་ལ་རང་ཉིད་ཤིས་ཤིག (Zurkharwa, Sage Advice of the Ancestors, Volume 1: 577-8)

Dhonden, the nephew of Amchi Yeshi Dhonden, one of the great master physicians of contemporary times, invited me to accompany him during a series of interviews for a five-volume biography of his uncle's life. Although shorter biographies had already been published (Dhonden & Hopkins 1986; Dhonden & Wallace 2000), this time, Amchi Yeshi Dhonden's family and students wanted an elaborated biography to document his life and clinical practice comprehensively: his early life, his education at Lhasa Mentsikhang[483], coming to India, his clinical practice, and his later years.

Kelsang Dhonden, who had been trained at D'asa Men-Tsee-Khang as a doctor and had graduated a few years prior to when I entered, was working in the Literary Research Department at the time. Gen Khenrab had requested his tutorial assistance for me when I was preparing for the medical school entrance exam. We got to know each other through regular meetings reviewing grammatical particles and root grammar texts, where he also interjected narratives of his own life and that of his uncle. Kelsang Dhonden had told me about the project with Amchi Yeshi Dhonden—Kelsang Dhonden would write the biography in Tibetan first. After his uncle approved the draft, I would translate and write the English version.

We spent a couple hours daily over several weeks speaking with and recording sessions with Amchi Yeshi Dhonden in his home, a small modest apartment above his clinic. It felt surreal to be sitting across the room of a legend, a Tibetan physician whom I had heard could be handed seven urine samples without ever having met the patients and then, after assessing the urine, walk into the patient room and accurately hand back each

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[483] Due to conventions established by each institution itself, the spellings of the institution in Lhasa and that in Dharamsala are Mentsikhang and Men-Tsee-Khang, respectively.

patient's urine. I had heard about the study conducted at University of California-San Francisco where an oncologist invited Amchi Yeshi Dhonden to treat a cohort of fourth stage breast cancer patients. The U.S. Food and Drug Administration had only provided provisional research approval for a handful of Tibetan medicines by the time they started the study[484]. Amchi Yeshi Dhonden was still able to achieve impressive results by Western standards with the small cohort of women (Tripathy 2001, 2017a, 2017b).

In these sessions, I enjoyed hearing about Amchi Yeshi Dhonden's life, his early experiences at Lhasa Mentsikhang, and his perspectives on how Tibetan medicine had changed over the years. He had an un-assuming casual demeanor, describing all his accomplishments with humility and ease. Despite his myriad contributions, he never boasted. He described cases matter-of-factly. In the mornings before our sessions, hundreds of patients lined up at his clinic door to see him. They came from all over the world to be treated. I was humbled and inspired to hear him relay his life to us. He said he was not the most studious student, nor the brightest. "I just kept practicing," he said. Although monastic, he also said he was not diligent in his Buddhist practice. On one level, his statements appeared to be standard cultural expressions of modesty. However, his attendant, an elder gentleman who had studied at Amchi-la's side for decades, nodded in affirmation of Amchi-la's account. The humanity of Amchi-la's approach was relieving and inspiring. Time, repetitions, and commitment, I thought.

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[484] FDA approval processes even for research purposes are long, laborious and costly. The study decided to proceed with those medicines which the FDA approved, despite a research design with a more comprehensive selection of medicines for Amchi Yeshi Dhonden to use (Tripathy 2017b).

After the first few sessions, I was struck by the sparse details in all his descriptions. I wanted to ask questions and have him expand on his experiences in his education, his approach to diagnostics, and so forth. Kelsang Dhonden encouraged me to let Amchi-la share what he wanted and discouraged me from asking too many questions. "You can ask a few," he said.

After the weeks of sessions had concluded and Amchi-la's narrative had arrived at the present time with his current clinical practice, I asked Kelsang Dhonden if he wanted to review the recordings. When I had originally offered to record these conversations, both Kelsang Dhonden and Amchi Yeshi Dhonden's immediate family agreed saying it would be valuable, but it seemed like an afterthought. Even with the skeletal details of his life conveyed, the recordings seemed essential in my mind to retain the narrative. Asking Kelsang Dhonden again if he wanted the recording, he responded, "Nah, it's okay." "How are you going to write a five-volume biography for him with such little detail?" I asked incredulously. "It's okay. I know most of it," Kelsang Dhonden answered. "Is it going to be like a *namtar*?" I asked half-joking, since I was well aware that these mythical biographies contain mostly larger-than-life details and flourishes. "Basically," Kelsang Dhonden replied.

I was shocked. The life and clinical experience of a contemporary living expert in Tibetan medicine like this should be told in explicit detail, I thought, not in the language of legends and myth where it is hard to distinguish the real events from the supernatural.

Legendary expertise exemplar: Yuthok Yonten Gonpo

Both at MTK as at SLL we studied the legendary supramundane biography *namthars* of the great figures in Tibetan medical history. Two of the critical figures studied by all medical students are the founders: Yuthok Yonten Gonpo the Elder and Younger. Yuthok the Elder is described as the royal physician for the Tibetan emperor Trisong Detsen in the eight century. Yuthok the Younger, who I will refer to as Yuthok Yonten Gonpo, a famous Tibetan physician of the twelfth century, is described as his direct descendent. Much controversy exists as to whether Yuthok the Elder existed, and there is extensive scholarship debating Yuthok the Younger as a historical figure (see for instance Yang Ga 2014). However, for Yuthok the Elder, his existence as a real person in history is irrelevant to my discussion because it is the aspect of the physician lineage conferred on Yuthok the Younger that is important here, as well as a link to an important time period in which Yuthok the Elder was alive and the *Four Medical Transmissions* was said to be hidden as a treasure text for later discovery[485] which eventually came into the hands of and was formalized by Yuthok Yonten Gonpo and his disciples (Yang Ga 2014:155).[486] Yuthok Yonten Gonpo thus retains the quality of lineage and the consequent

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485 Tibetan medical scholar and physician Yang Ga describes the account of Tibetan scholar and direct disciple of Yuthok Yonten Gonpo in his text *Effortless Accomplishment of the Five Bodies* (གཡུ་ཐོག་སྙིང་ཐིག་ལས་བྱིན་རླབས་བླ་མ་སྒྲུབ་པའི་ཆོས་སྐོར།) (Yuthok Yonten Gonpo et al 2007:361-390), where the *Four Medical Transmissions* is considered a teaching based on an emanation of the Medicine Buddha and taught by Rigpa Yeshe in Uddiyāna, an area thought to correspond to the Swat Valley in northern Pakistan. The account describes how the text was transmitted through various Indian physicians until the eighth century when Vairocana received the text from Candranandana of Kashmir and offered the text to Tibetan emperor Trison Detsen (742-797) who concealed it inside a pillar at Samye Monastery in order to be revealed in the future when it could be of greatest benefit. Yang Ga details the further account, "After 150 years, in the eleventh century, Drapa Ngonshe took it from the pillar and through Upa Dardrag, another eleventh-century scholar, and Totonon Konchok Kyab, who lived in the early twelfth century, the text finally came into the hands of a physician and scholar named Yuthog Yonten Gonpo" (2014:155).

486 Gen Jamyang has also given the account that Yuthok the Elder and Younger is actually an indication of association with Buddhist lineage where the term *nyingma (རྙིང་མ།)* and *sarma* (གསར་མ།) refer to associations with the old transmission of Buddhism retained by the Nyingma school and the newer transmissions retained by the Kagyu, Sakya, and Geluk schools.

nüpa[487] conferred through lineage. He also embodied characteristics important in role-modeling expertise and the ideal training approach. He was known as not only a physician, but a Buddhist master and scholar who had accomplished study of the five major Tibetan fields of knowledge. Likewise, his approach to medicine through the integration of the approach in the *Four Medical Transmissions* as well as the *Yuthok Heart Essence*, exemplified the integrated practices of medicine and Buddhism of generating expertise, in which there is little distinction of them as separate spheres of knowledge, but more as aspects of a single approach (Garrett 2014). His biographer and main disciple Sumtön Yeshe Sung describes that Yuthok began practicing medicine when he was very young, making six trips to India to study medicine (Yuthok et al. 2007:365-7; Yang Ga 2014:173), and made pilgrimages to important sacred Buddhist sites. The biography also details his trips to Nepal, Sri Lanka, Uddiyāna, and Persia to learn from the various medical traditions of the time (Yuthok et al. 2007:367-8). Yuthok Yonten Gonpo demonstrated his familiarity with and integration of the extant medical traditions of the time (2014:173). As Yang Ga describes, Yuthok Yonten Gonpo detailed his studies of *The Heart of Medicine* by the Buddha, "complete medical texts"[488] by the Buddha and by Manjuśri; Nāgārjuna's teachings; *White and Black Moonlight*[489] of unknown author; "the healing tradition of the *rishis*"; Vāgbhata's treatises; Indian and Chinese medical text; and clinical experience of Tibetan and Khotanese physicians—as detailed in his *Three Scroll Collections* (Yang Ga 2014:173). Thus, Yuthok's life demonstrates the

[487] རྒྱུས་པ།

[488] ཚངས་པའི་དབྱངས།

[489] ཟླ་ཞེར་དཀར་ནག

origins of the *Four Medical Transmissions*, the integration with Buddhist thought and practice, and the wider perspective that all medical knowledge should be the domain of the physician expert. His wide travels and accumulation of clinical experience with various expert physicians from various traditions at the time demonstrate the processes through which he gained his diagnostic and therapeutic skill, and the modes in which he conducted medical practice that serve as exemplars for physicians to emulate. Yuthok Yonten Gonpo is also described to have taught medicine, Sansrkit and the Atiyoga teaching of Dzogchen to various Tibetan rulers (Yang Ga 2014:173), as well as conferred empowerments. Here we see some of the themes written in "Activities and Qualities of a Physician" in the type of honor and respect conferred to Yuthok Yonten Gonpo during his life—gaining the reverence and devotion of the kings (TII, Ch 31:196).

Yuthok the Younger is acknowledged to have existed historically, yet his biography was written with the same supramundane qualities that make him beyond human. He achieved his accomplishments in his short twenty-four years of life, and was considered to be an emanation of the Medicine Buddha. His iconography depicts him as a man with long hair, depicting him as a layman with a family. His right hand holds a lotus with a flaming sword and Tibetan text, while his left hand holds a nectar filled vase adorned with saffron flowers and a wish-fulfilling jewel, in between a myrobalan fruit and golden *vajra*. This depiction associates the characteristics of Yuthok's life, and his association with Manjuśri, the Buddha of Wisdom, a vision of whom Yuthok is said to have had at eight years old. He is surrounded by various protectors that are seen as an extension of the greater assembly of protectors of the medical field. Tibetan physicians

have received the transmission of both the *Four Medical Transmissions* and *Yuthok's Heart Essence* in an unbroken lineage from Yuthok Yonten Gonpo in the twelfth century to present-day, as well as gaining the transmitted oral instructions and practicing the same meditative practices and offerings to the protectors. It is the role of the perfect mythic figure to provide a characterization of qualities which one should strive to cultivate, and a reminder of a fused medical and Buddhist pedagogy from the founder until today, with roots stretching back to the Buddha himself.

Yeshe Tsogyal, legendary expert in female form

As with the account of the life of Yuthok Yonten Gonpo, as I proceeded through my medical education, I gained familiarity with the *namtar* genre. I was particularly drawn to the *namtar* of Yeshe Tsogyal[490], the Tibetan consort to Guru Rinpoche, the Indian Buddhist master credited with spreading Buddhism in Tibet and quelling the obstacles so it could flourish. She became one of the greatest female Buddhist practitioners in Tibetan history and, like Guru Rinpoche, achieved great capacities in healing. In some ways, her *namtar* is considered a manual for the path of Buddhist training (Kyabgön Phakchok Rinpoche 2015), an educational guide of sorts on how to be

[490] There are several versions of Yeshe Tsogyal's *namtar* as well as accounts found in other works that mention her or aspects of her life (Gyatso 2006). The version I am most familiar with is found in the Rinchen Terdzöd (*gter ston brgya rtsa'i rnam thar*; *zab mo'i gter dang gter ston grub thob ji ltar byon pa'i lo rgyus mdor bsdus bkod pa rin chen bai DUr+ya'i phreng ba*; TBRC W1KG9281). The Rinchen Terdzöd is an extensive collection of the most important revealed *termas* (hidden-treasure teachings) of Padmasambhava, Vimalamitra, Vairocana, and other close disciples including Yeshe Tsogyal, compiled by Jamgön Kongtrül Lodrö Tayé with the help of Jamyang Khyentse Wangpo, and also contains the Yuthog Nyingthig. It is originally sixty-three volumes. Published by His Holiness Dilgo Khyentse Rinpoche in New Delhi, with the addition of several more volumes of termas and commentaries. The Tibetan text for Yeshe Tsogyal's *namtar* within is Taksham Dorjé, Khandro Yeshé Tsogyal kyi Namtar (Chengdu: Si khron mi rigs dpe skrun khang, 1989). Several English translations of her *namtar* also exist: Tarthang Tulku 1983; Dowman 1996; Gyalwa Changchup & Namkhai Nyingpo 2002; and Terton Drime Kunga, Yeshe Tsogyal, & Dzongsar Jamyang Khyentse 2017.

a proper student—irrespective of gender. I read her *namtar* several times finding the story inspiring and relevant to Tibetan medical education.

Her fierce determination, her dedication to gaining the capacities necessary to benefit all sentient beings filled me with awe. She encountered tremendous adversity—desecration of her own body, cultural and societal shame, assault and injury—bringing her to the edge of death on several occasions. And yet, she not only persevered, she excelled. She was known for her incredible memory—flawless, comprehensive, and astute. In fact, the first lines of her *namtar* detail this capacity: "As an emanation of the awakened heroine [Sarasvati], possessing perfect and unfailing memory, I composed this account of my life to foster all future beings' interest in the teachings" (Terton Drime Kunga et al 2017[491]).

Her perfect memory was instrumental in her ability to retain all the teachings of Guru Rinpoche, enact them for her own realization, and implement their capacities for the benefit of others. In Tibetan history, Guru Rinpoche has even been speculated by several preeminent scholar physicians to be a possible author of the *Four Medical Transmissions* (Yang Ga 2014). This capacity also allowed her to be the vehicle by which all of Guru Rinpoche's teachings were hidden across Tibet as hidden-treasures. Her capacities in health and healing were also renowned: she gained the capacity to bring life back to the dead, she could transform any substance into medicine and elixir, and she had perfect perception, able to see the foundation of causality and the interactions that manifest reality[492].

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[491] Translation adapted from original Tibetan.

[492] See Dowman 1996: pp 49, 68, 80, 21, respectively.

There are few *namtars* about women because their capacity for enlightenment and achievement is seen as inferior. I wondered if Yeshe Tsogyal's story had played a similar inspiration to the great physician Yangchen Lhamo, who is the most renowned cataract surgeon in Tibetan medical history, performing the procedure on the king of Bhutan and numerous Bhutanese subjects at the king's request due to its success. Yeshe Tsogyal's life story is unique and exemplary. It allowed me to see the cultural context of women in these endeavors, and the few who gained such expertise in either medicine or Buddhism. It also allowed me to see the subtle integration of Tibetan medicine and Buddhism. The aims are one and the same: the alleviation of suffering. Thus, Yuthok Yonten Gonpo's *namtar* was not the only one that had teachings and exemplars in the making of healing experts and the processes necessary to do so.

Today, female role models in the Tibetan medical field have become more prevalent, widespread and visible in the last several decades than at any other time in Tibetan medical history. Women comprise almost half of the total physicians in the Tibetan medical hospital, and female students outnumbered male students in most of my Tibetan medical classes, both in India and Tibet. However, I was surprised that my female classmates still viewed themselves as "less intelligent" than their male counterparts and less capable to enter any medical field. At lunch one day with a group of my female classmates from Gen Choying Rangdrol's class, they described how the guys in their class were "just better" at Buddhist logic and dialectics because they were more smart. "We can't think like that!" one of them exclaimed. I could not resist scolding them for this viewpoint, "You can do anything you want," I pleaded with them, "You're just as

smart as any of those guys in class." They smiled shyly at my remark. It reminded of my female nomad classmate Tsering Dolma asserting that all the men in our class were stronger than the girls and that is why they had the opportunity to gather—identify and familiarize—a greater diversity of plants. These plants required more arduous journeys across the mountain slopes and passes. Yet she clearly had greater endurance than almost any man in our class. She went out early and came back late gathering *tsa awa,* the one plant the female classmates were commissioned to gather. She stayed out in the cold rain and climbed steep slopes, when the guys were back at camp early, tired and cold.

"What department do you want to work in?" I asked my female classmates at this lunch setting in Amdo, referring to the departments at the Tibetan medical hospital. Almost unanimously each replied, "Gynecology department (*mo né tsenka*[493]." To the one that remained silent, I prodded, "How about gastroenterology?" She shrugged. "Look at Aja Menpa Dorje Tso. Or Yangdrung Tso. Shawo Drolma," I said, naming off the female doctors in that department, all of whom I felt were exemplary physicians and role models. Chimetso mentioned that Shawo Drolma was from her home town. "They are fantastic," I said. "Of course, gynecology is great and you can help many women, but don't choose it just because you think it is the only option. You can do anything you want," I exclaimed. I spent a month in the gynecology department during my winter break from MTK my first year. The treatment of patients felt more rough and homogenized, less focused on comprehensive care for the patients, or individual needs. Cervical ablations were common, and women were brought in sequentially, without pain

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493 མོ་ནད་ཚན་རྩ།

medication, for the procedures. “Scoot up to the stirrups!” the head doctor shouted. The female patients seemed fearless and tough, and the women doctors seemed to encourage this disposition. The prescriptions across patient files looked remarkably similar, despite the wide variety of approaches used for such conditions in the other departments that seemed to have strong results.

In the gastroenterology department, the female physicians seemed part of the team, neither rougher or gentler in their treatment of patients, nuanced in their prescriptions and treatments, and some of the most competent physicians in the department—several rising into the department leadership accordingly. Yandrung Tso spoke of the contrast between working at the hospital in her home town of Jentsa and then transferring to the Tibetan medical hospital in Xining. During her time at the Jentsa hospital, she observed very little Tibetan medical diagnostics conducted, she said. The focus was on Western diagnostics and Western treatments. When she came to the Tibetan hospital, she had a special opportunity to learn in a group of three other junior physicians with Aku Nyima. She said that he saw forty or fifty patients per day, and that is where she gained the experience of pulse and urine analysis, and proper Tibetan medical treatments. She had been a rigorous student throughout her education, and had achieved the doctor’s license early. Her medical license was the main reason she was recruited to the gastroenterology department, along with her skill in reading Western diagnostics, which the department used more than any other department due to the patient conditions they received. She maintained a quiet disposition, comprehensive and rigorous in her work, and not flashy. I did not observe her reciting other *sādhanās* beyond those we recited as a

department or for particular transmissions; however, it was clear that she was attentive to the techniques for gaining expertise: apprenticing with senior physicians, reciting the medical texts, engaging in specific Buddhist practices, and so forth. Her approach was more subdued than others, but clearly skillful and diligent.

I walked from my apartment across the street to the Tibetan medical hospital and frequently ran into Shawo Drolma from our department or Dhondup Tso from the External Therapies Department. I noticed that on the occasions I ran into each of them, I overheard them both reciting the Twenty-One Taras *sādhanā* daily on the way to work. Although variations on the Twenty-One Taras practice is recited by all physicians, genders and many lay practitioners[494], I did notice women tended to gravitate toward the female enlightened version more. Though all the enlightened deities in Tibetan Buddhism share one essence in that they are different manifestations of the same enlightened nature, practicing one deity, or having a specific karmic connection to that deity, may be more productive in the accomplishment of certain attainments in the practice. I wondered if the aspect of role modeling in female form played a role for these female physicians as well[495], just as Yeshe Tsogyal had been particularly inspiring for me, as well as female mentor scientists with whom I had the great fortune of learning from early on in my life.

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[494] In my surveys, the most cited practices across faculty and clinical physicians of both genders comprise: *Tara*, *Avalokiteśvara*, *Manjuśri*, Medicine Buddha, Yuthok Yonten Gönpo, as well as the triad Hayagriva, Vajravarahi, and Heruka—visualizations specific to our medical tradition as prompted by our daily prayers and recitations, and monthly *tsoks*. Many noted that our individual practices must be kept secret.

[495] The work of Nilanjana Dasgupta (2011) has shown that an individual's choice to pursue a particular professional path over another may be constrained by subtle cues in the achievement environment about who naturally belongs and who does not. Her work has shown that ingroup stereotypes are important in the development of self-concepts, and that role models create a form of social inoculation when the role models are part of one's ingroup and provide an example of achievement that may be distinct from the dominant stereotype (Dasgupta 2011:231).

Buddhist practice for physicians at the hospital was both individual and collective. Each physician engaged in their own morning and evening practices, prayers, and recitations at home or on the way to work, and then they collectively recited specific *sadhānas* as a department before seeing patients. These collective practices felt seamless with our preparations for daily rounds, part of normal routine in reviewing the medical texts and preparing one's self properly to provide proper diagnosis and treatment—proper development of compassion and insight, being part of both diagnostic and therapeutic tools.

In the hospital, one could observe different typologies of those who focused more or less on Buddhist practice, just as different physicians had greater skill in diagnostics or specific therapeutic applications. Some did not seem to put much attention into reciting certain mantras before administering a venesection cut or applying moxabustion, whereas others were very diligent about reciting the proper recitation related to the proper treatment. Physicians also varied in their attentiveness to attending important empowerments, transmissions and so forth. I saw one of our junior gastroenterology physicians at the *Hayagriva* empowerment at Kumbum monastery, and the same one at the Black *Manjuśri* empowerment the following week. He told me several other physicians attended both empowerments, but not in large numbers. I wondered if this was due to political sensitivities in attending an empowerment at a monastery versus one at the hospital where the latter could have the external appearance of a standard medical workshop from an official perspective. Nevertheless, I observed how physicians seeking these additional opportunities for continued learning and development form an auto-

pedagogy throughout a physician's life. This approach pervaded the clinical context—-all physicians are both professionals as well as constantly developing their skill further, working with root teachers, root lamas, and so forth. One might consider such studies as analogous to continuing education credits for medical professionals in the West. However, these studies were more focused, individualized, and focused simultaneously on the self-development of the physician as well as specific diagnostic and therapeutic capacities compared to continuing education in the Western medical context.

"We need to call Alak Jamyang!" exclaimed Dr. Takdrug Tserang, my main mentor and head of the gastroenterology department during my year interning there, when I told him that I would like to receive the Yuthok Nyingthik empowerment in Amdo. Dr. Takdrug Tserang recounted the times he had received the empowerment from Alak Jamyang, including related transmissions, teachings, workshops, and so forth. "He is quite old and not well these days," said Dr. Takdrug Tserang referring to Amchi Jamyang's condition at the time, "But he might still confer an empowerment." Dr. Takdrug Tserang called Alak Jamyang's attendant. I could hear the voice on the other side giving a quick response. "Not at this time," Dr. Takdrug Tserang conveyed the attendant's response to me after hanging up the phone.

Expertise in Tibetan medicine still requires this aspect of auto-pedagogy—personal determination and perseverance in seeking the proper opportunities, teachers, and lineages for both one's individual specific practices as well as those general to medical practitioners such as Medicine Buddha and Yuthok Nyingthig. One can continue practicing medicine without furthering one's skills in these areas and through these

additional resources; however, the contextual epistemology and cultural context provides significant motivation to do so. One is expected to be engaged in constant development of skills, both in the clinical setting and in Buddhist practice, since they are seen as achieving one and the same aim, the latter of which facilitates greater efficacy of the former. Several of my surveys given to faculty and senior physicians noted this: the greatest physicians are the ones who gain mastery over medical and Buddhist practice. The next category below, described as the really good physicians, are those who make comprehensive use of medicine only. And one rank below, for the good physicians, are those who have comprehensive understanding of both theory and practice in Tibetan medicine. One MTK student described her categorization as follows, "Experts are distinguished by having [particularly] cultivated strong compassion and loving-kindness for their patients." Although many noted comprehensive mastery over all theoretical and practical knowledge in the Tibetan medical field, several described that experts need not be great scholars in the commentaries and written discourse as long as they have achieved realization and mastery in compassion and wisdom. "The experts are those who have accumulated comprehensive realization and experience in medicine," which includes Buddhist practice. Very good doctors are "those who are able to achieve transient mundane benefit for all their patients," and good doctors are "those who look after their patient in all manners in which they can." These three typologies in the surveys mirrored the three categories of physicians in the "Activities and Qualities of the Doctor" chapter, but with more quotidian perspective and identified examples from their daily life.

Sangey Bohm and many of the physicians in the gastroenterology department articulated this perspective during my series of interviews with them in January 2012. They said that it is important to seek opportunities to learn from the most elder and practiced senior doctors, and for those mentors to correct and test the student by experience with patients. Sangey Bohm described how it is the old-timers in the remote rural areas with whom one must seek to learn. These are the ones who know their patients thoroughly, he said, and have amassed a lifetime of experience from which to learn. These are also the ones that observe the proper practices with regard to diagnostics: the proper preliminaries the doctor and patient must undergo before a diagnostic encounter, the proper vessels, timing, finger placement, observation cues, and so forth. Dorje Tsering, one of the rising junior physicians in the gastroenterology department, noted how the institutional setting of the hospital restricts doctors in how they can implement all the proper practices with regard to diagnostics. Shawo Lusham also described the role of senior physicians in maintaining the rigor of these practices. He said it depends on with whom you are learning. He said that during his fourth or fifth year after graduating, senior physicians used to have interns checking pulses of patients and correcting assessments all the time. He described how the pressure of paperwork and ordering labs and images these days has distracted many senior physicians from cultivating the learning environment for interns.

Dr. Takdrug Tserang was an exceptional mentor in exemplifying and cultivating the auto-pedagogical method. He had an additional version of the entire *Four Medical Transmissions* copied with a six-inch margin surrounding each page, upon which he

wrote detailed notes that elucidated points from the commentaries and from patient cases. Similar to Gen Dontsé's thirteen volumes of similar notes of analysis and reflection, Gen Takdrug Tserang maintained his notes assiduously. He was also one of a select few of more senior physicians who spent several hours per week with Aku Nyima furthering their learning. In this institutional context, they were reenacting the central role of the teacher-student transmission in our pedagogy, deepening their understanding of the text through oral instructions from one's teacher in addition to the volume of patient cases. Dr. Takdrug Tserang also assiduously used quotes, metaphors, and examples from the text to explain and contextualize what we were seeing in the clinical setting. He even administered oral examinations on the textual memorization of sections from the *Four Medical Transmissions* particularly relevant to the gastrointestinal department for incoming interns, junior physicians, and periodically for all his staff physicians to maintain this strong relationship to the text and the specific verbatim articulation to fortify these theoretical foundations and properly layer in experience.

Dr. Takdrug Tserang cultivated a rigorous learning environment. In patient rounds each morning, he encouraged interns and junior physicians to take comprehensive assessments of pulse, urine, and tongue for each patient, and write notes that cited proper passages from the *Four Medical Transmissions*. In my mind, Dr. Takdrug Tserang exemplified a budding expert.

Yet unlike many of his doctoral classmates physician colleagues, Dr. Takdrug Tserang seemed to know how to weave tradition and the necessities of its pedagogy through a contemporary institutional setting where he played an official role. In this

sense, Dr. Takdrug Tserang provided an example of what Shawo Lusham had described important for senior physicians in shouldering a large part of the responsibility in creating a learning environment for the next generation of experts—particularly in this modern context of a large institution with many students and many physicians, and each student having many mentors. Dr. Takdrug Tserang also embodied what Sangey Bohm described in the students taking responsibility and initiative for their own learning as well—seeking skilled mentors and honing their intellectual, mental, emotional, and physical skills to be proper vessels for such learning. Dr. Takdrug Tserang was both mentoring physician and mindfully determined student. He clearly kept his vows in conduct regarding abstaining from alcohol, proper social conduct, and maintaining his personal daily practices, and by example, reminded us of this larger context of developing compassion and wisdom in Tibetan medicine and its role in both diagnostics and therapeutics.

My classmate Chimetso provided another example of characteristics that I would identify as on the trajectory toward expertise. A tiny energetic yet disciplined individual with big round black glasses, neat comportment, serious demeanor, and warm smile, she was extremely studious, quiet, and reserved, and thoroughly detailed in all her studies. She has a sharp mind and wit, and had expressed to me that she had "little time for socializing" while in school. She assisted me on my first day of class when I was trying to find the bus stop out the back gate of the school. We grew closer over the year, such that she became one of my closest friends in the class. She has a maturity and confidence that few others in the class had, and I wondered what had uniquely shaped her during childhood. When I asked her to be my roommate during our internship period, she started

opening more about her family and childhood. She described her father getting sick and going to Menpa Tsedra of Sokdzong. Her father's condition worsened quickly by the time he was able to get to Menpa Tsedra. Menpa Tsedra recognized her father's serious condition and gave him strict dietary restrictions along with the medicine. Initially her father improved, but then deteriorated rapidly and passed. Chimetso recounted how she had seen her father having initial symptoms for a long time before she realized he was actually sick. She described how losing her father to what she now feels was chronic peptic ulcers that had become gastric cancer motivated her to become a great doctor. "If I had known what I know now," she said, "I really think we could have saved him. He would have started taking the Tibetan medicine many years earlier."

I could see how this experience drove her to be an exceptional student. She had memorized the three of the four transmissions of the Four Medical Transmissions and performed the oral recitation with such clarity, articulation, and deliberate speed that Gen Rinchen Dhondup and Gen Samdrubgyal said it was one of the best recitations of the three transmissions they had ever heard. Her knowledge of the content was also exceptional. When her intern round assignment came to Gen Namlhakhar, one of our top senior outpatient gastrointestinal physicians, he would not let her go to any other department. He wanted to keep her by his side as such a proficient assistant, and also help develop her knowledge and skills. I knew she was a rising star. Like Dr. Yangdrung Tso in gasteroenterology, Chimetso was an assiduous student. She punctually attended opportunities for teachings, empowerments, and transmissions, but kept a low profile in such assemblies.

I planned to see Menpa Tsedra after our graduation, and Chimetso made me promise that I would take her with me. In many ways, as a foreigner, I had more exceptionalism in the ways I could meet teachers and spend time with them. These were opportunities for which my classmates would need a proper introduction from a teacher or relative who had a formal relationship with the teacher, not a possibility to just show up and learn. Even though Chimetso's father was a close friend and former patient of Menpa Tsedra, the opportunity of me traveling to see him provided the additional conditions for her to meet him. I also wanted to make sure she had access to this opportunity because I knew that despite her great accomplishments academically up to this point, she would still need to persevere in making use of any opportunity to study with expert physicians that she could, particularly as a woman whom many senior physicians are reluctant to accept as a student due to their greater liability for safety and the perception that they would cease studies after marriage. I knew Chimetso wanted to have a family some day, but her priority to become an excellent physician continued to put such plans on hold. Although not an expert nor even a physician with significant experience yet, Chimetso provides an example of the practicalities of developing expertise. She demonstrates the role of subjective experience in gaining greater motivation to effect results in helping others, combined with the personal determination to learn and gain clinical experience, and the karma of lineage and opportunity. Chimetso shows that the development of expertise draws upon various modes of gaining expertise.

Compassion versus empathy

In medical contexts, it is easy to confuse empathy, the ability to resonate with others' positive and negative feelings, and compassion, the feeling of warmth, concern and care for the other, along with a strong motivation to improve the other's wellbeing (Singer & Klimecki 2014). Compassion is feeling *for* the other; empathy is feeling *with* the other. The shared feeling of suffering can allow for an understanding of the experience of suffering for an other. However, an over-identification with the other's suffering often creates distress, which often prevents actively responding to others' suffering, and conversely can lead to withdrawal and non-social behavior. In order to prevent empathic distress, and allow for compassion to direct attention and action, one must develop skills to properly recognize others' emotional states—irrespective of positive or negative valence—and develop the feeling of concern for the other person's suffering with an accompanied motivation to take action in relieving that suffering. In a secular setting, the most widely used technique to train social emotions like compassion is through 'loving-kindness training' (Singer & Klimecki 2014) that fosters feelings of benevolence, kindness and interdependence. Barbara Fredrickson (Fredrickson et al. 2008) has shown that even several weeks of regular compassion training can increase feelings of positive affect, personal resources, and well-being for an individual during everyday life, as well as develop a sense that one can benefit others. Tania Singer has shown that such training increases rates of altruistic action toward strangers in non-reciprocal contexts (Singer & Klimecki 2014).

I did not expect the responses to the surveys I gave the faculty and my physician mentors to generate much detail about their personal responses. Many noted that assessments of their personal practices—both identifying which practice and progress within the practice—was secret and unsuitable to report. Likewise, from my experience working with Carol Worthman on practices of monastics in south India related to daily and lifetime experiences, I expected significant modesty in personal assessments of their practice skills. However, I was surprised that despite this modesty in describing which practices in which they engage—for example, how much stability in *shamatha*[496] practices, or how much clarity in vipassana[497], guru yoga[498], and so forth—the personal assessment of the effect of compassion meditation transforming their behavior was consistently rated high[499]. Likewise, compassion and *bodhicitta*—integrating all four immeasurables of compassion, loving-kindness, sympathetic joy and equanimity—was commonly marked as the most important method in generating the mind of the physician[500]. As discussed earlier, the four immeasurables is specifically indicated for physicians to practice in the "Activities and Qualities of a Physician" chapter described earlier. Several of the faculty and clinical physicians also cited Dzogchen as their main

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[496] ཞི་གནས།

[497] ལྷག་མཐོང་།

[498] ལྷའི་རྣལ་འབྱོར། མདུན་བསྟེད། བདག་བསྐྱེད་ལ་མོས་གས་པ།

[499] ཀུན་སྤྱོད་ཡོངས་སུ་བསྒྲུབ་སོང་། ཕན་དང་མི་གཞན་བར་ཐེ་འདེལ་བ་ཡོངས་སོ་བསྒྲུབ་སོང་།

[500] The survey question was written as: ཁྱེད་ཀྱི་ཉམས་མྱོང་ནང་སྨན་པའི་བྱ་བྱེད་ཀྱི་ལས་འགན་སྲུང་བར་དོན་གཉེར་ཐེ་བྱོས་སྐྱེད་ཕབས་ཡག་ཤོས་གང་རེད་འདུག་གསུ། ("In your experience, what is the best method to generate the motivation to be a good physician" (lit., "In your experience, what is the best method to generate the mind aspiring to protect the responsibility of the physician and proper medical conduct."). The most common response was: སྙིང་རྗེ། (compassion). The response identifying the most beneficial practice in doing so varied, however, "six perfections" is an example response.

practice. Dzogchen is a central practice to the Nyingma school of Tibetan Buddhism, and integrates the highest forms of deity visualization, after which one rests in the natural state of the mind, which is luminous and aware, a phenomenological integration of compassion and insight. I was also surprised to learn the six qualities of the physician, three knowledges, and two principles to remember were described as easy to achieve, despite the understanding that such qualities apply to the highest level of realization and compassion.

Compassion as directing attention

As described in Dharmakīrti's approach to *pramāṇa* theory in Chapter V, purpose directs consciousness to perceptually attend to the subset of causal characteristics of an object that generates a particular phenomenal form from which an inference is drawn. In Tibetan medicine, compassion provides the purpose that directs the consciousness to attend to a specific subset of causal characteristics to create a phenomenal form that has causal efficacy in tracking suffering and its alleviation. This dynamic has been described more explicitly in Ozawa-de Silva and Ozawa de-Silva's article on "Mind/Body Theory and Practice in Tibetan Medicine and Buddhism" (2011), showing the necessity of compassion in directing and achieving the therapeutic relationship between physician and patient. Recent work in cognitive neuroscience has shown that the effects of meditation in emotion regulation skills may be primarily due to the improvements in attentional skills (Chambers et al., 2009; Wadlinger and Isaacowitz, 2011) and that such skills transfer to what researchers have described as non-meditative states (Desbordes et al. 2012). 'Non-

meditative state' is a term to describe a cognitive state in which a person is not 'actively' meditating; however, for more experienced practitioners, most cognitive states would be considered meditative, or engaged in meditative approach.

Frameworks for transformation

As I spent more time with senior physicians and experts, I observed a paucity of details from their personal lives that they shared openly, and few instances where they reflected on their personal journey, learning processes, and motivating life experiences. I realized this was the cultural landscape in which my education was situated. I also observed that the extraordinary narratives of the great masters from ancient times fused with the heroic role models we sought to become. Very few life stories were not described in the genre of *namtar*. It provided a framework for transformation, a place for the sacred, a realm for the untouchable. These were the legendary perfected beings with perfected skills and perfected capacities that anyone could strive to become and toward which one would continuously strive and develop to become. It did not matter if one ever "made it" to perfection so to speak, because it is in the striving where the learning occurs —and where the skills actually develop.

The *namtars*, the great experts, and the qualities described in the last chapter of the *Explanatory Transmission*, as distant and unattainable as they may seem, elucidate qualities of compassion, insight, realization, piercing brilliance, wisdom, and skill with such perfection, that one is constantly striving to improve on these personal, humanistic qualities as well as mastery of the rigors of medical knowledge and skill.

Why tell the actual details of how Amchi Yeshi Dhonden uncannily diagnoses urine? On one hand, he may not be able to explain how he does it; like a fighter pilot might not be able to explain how he flies a jet, he just does so with performative excellence. In my dozens of surveys and interviews with faculty, physicians and experts in both Dharamsala and Xining, the question of "what makes an expert?" always came back with quotes from the *Four Medical Transmissions* or examples of role models, or identifying qualities of these quintessential perfected figures—the Medicine Buddha, Yuthok Yonten Gonpo, and so forth. Methods of becoming were methods in diagnosis, and transforming the self— cleansing the vessel—as honing the diagnostic instrument.

Models for cleaning the vessel, honing the instrument

In the text, in class, in the clinic, and in ritual settings like empowerments descriptions of self-cultivation as well as gaining practical skill were described as training ourselves as vessels to be properly cleansed, purified, honed, melded, crafted, sculpted, and bronzed. We were developing the very embodied diagnostic skills that were the causes of transformation for our beings. Methods in becoming *became* methods in diagnosis. The more we memorized and recited, the more skills we gained toward attentional stability, non-distraction, seeing into dependent origination, engaging causality, cultivating empathic awareness, and developing perceptual acuity. We were simultaneously developing humanistic capacities, as well as honing diagnostic skill.

This process seemed quite distinct from what I had heard about medical education from my father and peers who had gone through Western medical school, as well as that

which Mel Konner details in his hallmark ethnography of Western medical education *Becoming a Doctor* (1987). Though the ultimate aim of all physicians is to alleviate human suffering, Konner reminds us, the scientific project has blinded the Western medical enterprise to this initial objective (Konner 1987:154). In reference to Freud and the schism between the medical establishment and psychoanalysis, he notes "There is no place in medical science for the enshrinement of the ancients" (1987:156). This provides an insight into a primary process of embodiment in Tibetan medicine: compassion. In order to have compassion for another, one must see life as sacred and respect the knowledge and predecessors that provided that knowledge. There is substantial enshrinement of the ancients in Tibetan medicine. Every morning we recited the lineage prayer, naming all the great physicians of our tradition, recognizing those who had gone before us, their achievements, realizations and insights, and aspiring to achieve great things in medicine during our own lifetimes — or the next.

In Western science, we often describe the newest findings as the best, and shun historical understandings as uninformed or less realized. However, in Tibetan medicine, there is an assumption that those who went before us, were more knowledgeable, more skilled, and more insightful and skillful than we are now. We look to our predecessors as exemplars — in both medical knowledge as well as qualities in self-cultivation.

In Western medical education, Konner describes a need for a humanistic medicine that focuses on building the human qualities we ask our healers to enact. He describes the need for true role models with not only excellent medical knowledge and practical skill, but personal qualities to be emulated, returning to our discussion on the importance of

role models. Konner describes how Western medical training virtually drives compassion out of budding physicians. As an example, he describes the approach of one of his mentors, "This appearance of enduring concern for patients was phony….His medical students and residents were so brutalized by the pressures he put on them that it was a miracle if they remembered their patients from one day to the next…Of course we wanted to care about our patients in that personal way. But he and others like him had set up our training in such a way as virtually to prevent caring" (1987:263).

A New York Times headline during Konner's last week in his surgery internship read: "Scientific Detail Overwhelms Regard for Human Needs at Medical Schools," citing the first comprehensive review of medical education by the Association of American Medical Colleges in fifty years. A blue-ribbon committee of medical educators and administrators conducted the study. "Specialization and the rapid rate of advancement of knowledge and technology," their report was quoted as saying, "may tend to pre-empt the attention of both teachers and students from the central purpose of medicine, which is to heal the sick and relieve suffering…The relief of suffering requires that physicians have an exquisite regard for human needs," which must be "taught largely by example." He points to the central mechanism of developing character: role models and purpose to frame which skills are necessary and the means to develop them.

Embodiment through emulation

Konner describes that the residents "have the most responsibility for the presentation of physician-models in the clinical phase of training" because new medical

students have the most direct exposure to them (Konner 1987:363). And yet, he says, the residents are "outrageously overworked, sleep-deprived, overburdened with responsibility, bewildered by a barrage of ever changing facts, and oppressed by the medical hierarchy, of which they are on the lowest rungs" (1987:363). Konner notes the critical influence of role-modeling: "The process of modeling by teachers is a ubiquitous, if unmentioned, aspect of training in any field. In the clinical years of medical school this process is explicit, and is the lifeblood of the program. But there is more than meets the eye, more that is, than learning hands-on procedures that cannot be taught any other way. The physician's attitudes, mind-set, moral stance, and the hour-by-hour decisions about how to use one's time—all these and many other subtle matters, even including how and what and how much to feel, are observed by the student and imitated assiduously" (Konner 1987:363).

In Tibetan medicine as well, the student is encouraged to emulate one's teacher in all aspects. In her book *Being Human in a Buddhist World* (2015), where she provides an account of the intellectual history of medicine in early modern Tibet, Janet Gyatso describes with surprise the detailed instructions in a commentary by Sumtön Yeshe Süng, one of Yuthok Yonten Gonpo's closest disciples, on the meticulousness with which one should model one's behavior after one's teachers. She refers to the passages in the medical conduct chapter describing the thirteen faults that mark a poor physician. One of these stanzas scorns those physicians without experiential knowledge, that is, gaining

familiarization by seeing practice first hand[501], saying they will become poor physicians, and constantly doubt their diagnostics (TII, Ch 31:197).

The emphasis of emulating one's teacher even goes so far as to challenge important soteriological aims in the Buddhist project, Gyatso argues. The commentary describes intentionally gaining familiarity with "conditioned action,"[502] which Gyatso appropriately notes is a term for a type of reification and "crystallization of habits and the collection of karma" that is not good because it is synonymous with remaining in the state of samsara (Gyatso 2015:373). However, for medical training, habit formation and familiarization in performing therapeutic procedures, compounding medicine, conducting diagnostics, engaging with the patient and so forth is not only desirable but essential. Here we see another theme in this work that, though medical practice is set within the soteriological aims of the Buddhist project, it uses certain techniques and analytical tools, such as training the senses, for secular purpose. This may seem contrary to what Dharmakīrti advocates in his framing of ultimate aims in *pramāna* theory, but is still within the realm of proper training in valid cognition.

Gyatso's surprise is particularly directed at a passage describing the "unusual level of intimacy with the teacher that apparently was deemed especially apt for the medical student" (Gyatso 2015:374). She notes that such a proximity of relationship is "known to us from Buddhist accounts of the teacher-student relationship," but the degree

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[501] མཐོང་གོམས་མེད་པའི་སྨན་པ་དེ། རྒྱུས་མེད་ལས་དུ་ཞུགས་པ་བཞིན། ནད་རྟགས་དཔྱད་ལེགས་ཚོམ་འཛུར། (TII, Ch 31:197)

[502] འདུས་བྱས་ཀྱི་ལས།

of mimicry encouraged is surprising as noted in another passage from Sumtön Yeshe Sung's commentary:

> Achieve everything that he commanded you when you were in front of him, and that you could not refuse to his face. It is not the case that privately you can not do what he commanded. Making no [distinction between] face and private, just do what he commands. In this way, all of your activities accord with what pleases the teacher. If his mind is small, then also make your own thought small. If his is big, then make yours big. If he keeps medical materials, you should do likewise… If he has big desires, or likes farming, or likes to fight, or likes the Dharma, or likes to play and so on, in brief, whatever sort of behavior and orientation the teacher has, by whatever means there is to please him and in whatever order, you should follow suit and respect him" (Ye shes gzungs 1976:273-4; Gyatso translation).

I never observed this degree of imitation by a student of any of our medical faculty at MTK or SLL. However, this passage does speak to the degree of familiarization and simulated embodiment that students attend to in observing and taking on practices from their teachers.

For example, when I spoke with one of our senior physicians in the brain-heart department[503] about his method of pulse-taking, he responded, "You probably do not want to learn my method because mine is the method I learned from my teacher, which comes from the tradition of Ju Mipham. It is different than the standard way of taking pulse in that it places the fingers at the first wrist crease instead of the second." I was surprised there was another tradition of placing the fingers. The chapter on pulse analysis in the *Four Medical Transmissions* states clearly, "From the first crease on the wrist, one finger width below, at the side of the bone prominence, place index, middle, and ring

[503] ཀུང་སྙིང་ཚོན་ཁག

fingers, evenly without pressing too deeply"[504] (TIV, Ch 1:209). It seems difficult to interpret these stanzas otherwise, but I could see where another approach could place the fingers *starting* from the first crease, which measures one finger-width across to the bone prominence, and then lay the other fingers sequentially from there, as skin, flesh, and bone depths, respectively.

Exemplars and lineage formation

This interaction reminded me that even within the Tibetan medical hospital, micro-lineages and micro-traditions are constantly at play. Despite overarching similarities, the tradition is significantly heterogeneous because of the dynamic of oral instruction and following the form of one's teacher. Even in the institutional approach of Tibetan medical education, after graduation, these micro-traditions particularly take hold and the teacher-student relationship becomes even more pronounced. This may be a distinct difference from the time when Amchi Yeshi Dhonden was a student at Lhasa Mentsikhang because he described that, at this time, clinical practice, textual learning, and medicine compounding were fully integrated into their daily schedules. They had a pronounced teacher-student relationship from the beginning of their education.

Referring to the educational context at Lhasa Mentsikhang during Amchi Yeshi Dhonden's time, Gen Jamyang relayed to me, "They were a *menpé dratsang*[505], a monastic medical college. So they were a small group of students, all monastics, all

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[504] བཤད་གནས་མཁྲིག་མའི་གཉེར་མ་ངང་པོ་ནས། མཚོན་གང་མར་བཅལ་རྒྱས་པ་འབྱར་པོའི་ཕྱེབས། ཚོན་ཀན་ཆག་གསུམ་མ་འདྲུས་སྟོམས་པར་བཞག (TIV, Ch 1:209).

[505] སྨན་པའི་གྲྭ་ཚང་།

studying together, preparing medicinal ingredients together, compounding medicinal formulas together. At that time, there weren't many physicians, nor were there many students or patients. It was all small-scale." He continued, "The reason we can't do this today is because Tibetan medicine has expanded. There are many more patients, more medicine is required, and we are not all monastic. The education needed to adapt — now we need to set aside time for proper curricular study from the time in gaining clinical experience as an apprentice, and now many students do not learn much compounding during the six-year *kachupa* degree curriculum—they must spend more time afterward learning these skills specifically, and only if they are interested."

Persistent modes of transmission and conferring nüpa

However, I did notice that the context for micro-traditions was still recognized by our teachers among my classmates even during our curricular years—it provided a particular understanding of the generation of expertise in Tibetan medicine as well. In our external therapies class with Gen Tashi Dhondup, we learned about "stick therapy[506]." Aku Tangdzin[507], one of the great senior physicians in eastern Tibet today as well as a high monastic practitioner, had just come to the Tibetan hospital to provide the empowerment and transmission of the root text (since it is not described or even mentioned in the *Four Medical Transmissions*). Aku Tangdzin described how physicians are not allowed to even look at the stick instrument without the proper empowerment. I

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[506] དབྱུག་བཅོས།

[507] ཨ་ཐུབ་དཀོན་འཛིན།

was surprised by this strict approach to the practice. I had not heard of this convention for any of our other medical instruments, even those that had been used historically for surgical practice. My classmate from Sok-dzong was preparing his graduating thesis on this practice. He came from a region known for this practice and was considered a lineage holder. After he completed his presentation on his thesis to the school, Gen Tashi Dhondup implored him, "You must work hard to preserve this practice, ya' hear me?" The student looked up at Gen Tashi Dhondup with sheepish eyes, a sign I took of humility.

I was delighted to learn that we had a lineage holder for this special practice among our classmates. With this background, it was assumed that he would have a greater proclivity for success in using this therapeutic technique because of the *nüpa* (potency or capacity) conferred to him by belonging to this lineage. He would have a greater facility in gaining expertise generally, but particularly in this practice. In part, the *nüpa* is understood to arise from his exposure to specific oral instructions and practical observation and familiarization of its use and techniques. However, there was another more subtle *nüpa* understood that he himself would have an aptitude for proficient use, learning, and successful treatment of using this technique—because it flows in his blood just like those from doctor families have a special *nüpa* or quality to their fingers to gain insight into diagnostics in pulse analysis.

In the sections above, we have seen how the Tibetan medical tradition approaches expertise, including the use of legendary exemplars such as Yuthok Yonten Gonpo, Yeshe

Tsogyal, and briefly discussed Guru Rinpoche, and historical figures of senior physicians including contemporary masters glossed in supramundane light as instructive role models for skill development, representative ideals, and motivational learning. I now turn to the investigations cognitive neuroscience has conducted on expertise, highlighting some of the consonant findings with our discussion of training embodied knowledge in previous chapters, but now for application in expert performance. I look at how cognitive neuroscience characterizes expertise and the processes of skill development necessary to achieve expert level performance. I also comment on the place of cultivating humanistic interest and empathic connection with one's subject in gaining expertise, as well as the function of role models as driving expertise development by providing illustrative exemplars of both process and outcome.

After the section on cognitive neuroscience approaches to expertise, I will complete this chapter by re-visiting perspectives from Dharmakīrti's *pramāṇa* theory in perceptual expertise and how it informs the role of critical rituals, such as Yuthok Nyingthik and Medicine Buddha practices, for Tibetan physicians in becoming experts.

Part II. Expertise in Cognitive Neuroscience

Expertise has been one of the major challenges in cognitive science research over the last several decades (Ericsson & Smith 1991). This research has tried to understand the mechanisms underlying mastery in performance in various domains, from medicine, physics, and chess to sports, dance, and music. Hungarian psychologist Mihaly Csikszentmihalyi led much of this work through what he has called Flow theory (2008), a

highly focused mental state that he characterizes as the mental experience of expert performance. Swedish psychologist K. Anders Ericsson has tested these theories in his Human Performance Laboratory at Florida State University, assessing what facilitates high performance in various domains.

In order to come up with general theories of expertise, Ericsson and functional psychologist Jacqui Smith invited representatives from various major domains of expertise in which expert performance had been empirically studied extensively. Chess expertise, particularly the pioneering work of de Groot (1978) and Chase and Simon (1973), provided a model for their approach. Ericsson and Smith ruled out domains that involve events of fair games of chance (1991:2). They also required that a "control" group exists, or a larger group of other individuals. They used various measurement dimensions such as inherited versus acquired, general (e.g., intelligence, personality) versus specific (e.g., music ability, spatial ability), life experience and educational background (e.g., language, study strategies), and domain-specific training and practice.

As Ericsson and Smith have learned, expertise is difficult to assess. It draws upon perceptual acuity, mental processing, generating appropriate response and so forth—an ambiguous and varied collection of cognitive bases that synchronize to create proficiency in a given area. However, Ericsson has noticed something consistent: "Experts see the world differently. They notice things that non-experts don't see. They hone in on the information that matters most, and have an almost automatic sense of what to do with it. And most important, experts process the enormous amounts of information flowing

through their senses in sophisticated ways." One of the common areas that Ericsson has investigated across domains is memory.

Expertise in memory

Expertise in memory has been assessed in waiters, doctors, baseball fans, violinists, soccer players, snooker aficionados, ballet dancers, abacus wranglers, crossword puzzlers, volleyball defenders, birders, as well as the previously mentioned taxi drivers and memory champions[508] (Foer 2012:53). Ericsson's work has shown that it is less that those who have a natural talent for a certain field will gravitate toward that field, but more that mastering a specific field produces a better memory for the details of that field. Experts develop techniques to overcome the working memory constraints of only maintaining six or seven "chunks" of information at a given time (Foer 2012:55). So for example, seven phone numbers are chunked into three digits and four digits, and credit card numbers are chunked into groups of four. In a similar way, Tibetan poetics "chunk" information into poetic verse that allows one to put a large amount of information into small memorable verses and put those verses into chunks of memorable stanzas. Likewise, texts in both Tibetan medicine and Tibetan Buddhism have extensive hierarchies of categories and subcategories, narratives and metaphors which allow for memorizing larger volumes of text as massive chunk segments. When one needs to remember large volumes of information, decreasing the number of chunks that one remembers helps working memory recall them (Foer 2012:61-62).

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[508] He tested Josh Foer before and after Josh trained in memory techniques for one year to become the national memory champion (Foer 2012:54).

Ericsson developed “Skilled Memory Theory” (2003) from results of a 1981 experiment that he and fellow psychologist Bill Chase conducted with a Carnegie Mellon undergraduate named SF, who memorized numbers several hours per week in their lab for two years. Starting off at reading numbers to the student at the rate of one number per second, the student progressed from remembering seven numbers initially to seventy, a factor of ten greater, by using techniques of chunking (Ericsson & Chase 1981). In order to make chunks that were personally relevant and memorable, he made associations with an activity in which he excelled: running. By associating the numbers that were read off with running times, he created more meaningful strings of digits connected to his experience.

As described in an earlier chapter, this is why synesthesia is so productive for memory because it is a full sensory, meaningful and experiential engagement with a list of numbers or a series of sounds. Josh Foer, who became world memory champion with just a year of training, describes how those who become experts in memory make associations that are meaningful and, by building up a bank of experiences that shapes how they perceive new information, they are able to expand the capacity of their memory and use their memories to see the world differently (Foer 2012:62).

Expertise in perceptual skill

Perceptual expertise has also been studied fairly extensively in athletics (Scolari et al 2008). Perceptual expertise is defined as “an enhanced ability to carry out subordinate-level discriminations with a specific category of stimuli” (Scolari et al

2008:215). It suggests that more efficient mental representations of information and imagery occur through more 'holistic' encoding, which cultivates relationships across individual features rather than the isolated features themselves (Scolari et al 2008:215).

Scolari's account is precisely the approach that visualization in Tibetan medicine uses through pedagogical applications of allegorical trees, metaphor and so forth. Cognitive psychologists suggest that more efficient representations may occupy less space in visual working memory and thus allow for a greater number of objects to be stored (Scolari et al. 2008:215). However, Scolari and colleagues have shown that there are two distinct facets of cognition: the number of chunks working memory can hold and the perceptual resolution of those chunks. As described above in memory research, experts develop skill in creating larger chunks even though they cannot expand the number of chunks working memory can hold at a time. Simultaneously, they gain higher resolution in those chunks because they are linking them to full sensory mental images that connect to personal experience, or in Dharmakīrti's framework, purpose. Similarly, in Tibetan medicine, experts can remember larger amounts of texts by creating chunks of the texts with their systematization and linking larger conceptual metaphors around recitation chunks and subjects. The chunks are layered with high resolution details from their extensive visual and enacted clinical experiences engaging the content of those chunks for the *purpose* of alleviating suffering and from the *personal* paradigm of enacting the textual content. These processes demonstrate simultaneous parallel processing and hierarchical integration. Additionally, specific conceptual frames allow

for the relating of perceptual information into holistic types such as *rlung*, *tripa* and *béken*, where expert physicians can retain these large amounts of information.

Tanaka and colleagues (2005) found that a hallmark of perceptual expertise is the ability to classify objects at increasing levels of specific subordinate abstraction compared to novices (145). They focused their study on the perceptual expertise of bird identification: family-level to species-level discrimination of individuals. Since experts have greater exposure to the objects of their domain (in this case, birds), they are better able to grasp perceptual detail than novices. Solomon, Medin and Lynch (1999) show that assigning object categories relies on the record of a perceiver's past and serves as a bridge to new object instances to form new object categories. In the context of bird identification training, they note that when novices learn subcategories of birds in finer detail, they also increase their capacity for identifying specific types and individuals of birds. As presented in the last chapter on the conceptual-perceptual dialectic, universals or conceptual cues describing perceptual content play a role in "priming" the senses to pick up greater perceptual detail when viewing an object. Dharmakīrti discusses this learning process as creating the *vāsanā* or karmic imprints for future recognition of how particulars are grouped by common negation of other particulars through apoha theory.

However, as Dharmakīrti's *pramāṇa* theory predicts, training in conceptual characteristics for recognizing finer details of object types leads to a phenomenon known as "perceptual transfer," where previous perceptual memories accentuate or alter perceptual experience due to the conceptual pre-programming. In the study by Tanaka and colleagues, two types of perceptual transfer occur: transfer to the recognition of new

instances of existing categorical representations and transfer to the discrimination of new instances from novel species categories (2015:149). They highlight a distinction between perceptual exposure and perceptual experience. The cognitive experience of a perceptual event was "profoundly influenced by the category level used in the training task" (Schyns 1998). Due to the requirement for perceptual specificity, "subordinate-level training requires that participants attend to properties of an object's shape and color at a level of detail that is more fine-grained than is required for basic-level judgments (Jolicoeur, Gluck & Rosslyn 1984). Thus, subordinate-level learning produces flexible object representations (Edelman & Bülthoff 1992; Tarr & Pinker 1990) that allow for identifying novel exemplars and details that generate greater perceptual abilities as well as more rigorous attentional strategies (Tanaka et al 2015: 150). Such training selectively tunes an individual's perceptions of color, shape and texture cues—similar to the perceptual aspects that Dharmakīrti describes and the kind of aspects that Tibetan medicine entrains. These are the characteristics of expertise—fine attention, guided experience, and nuanced understanding of its object of study, such that the expert is sensitive to features that signal new, unfamiliar characteristics (Tanaka et al. 2015:150) as well as individual instances of familiar characteristics. We will see how this relates to the Tibetan medical understanding of expertise later as we discuss classic references to the expert ability to discriminate the finest nuances of all objects in the natural world—gem, plant, soil, mineral, animal, water —because all can be used in and for medicine.

Perceptual expertise can also be seen at the neurophysiological level by analyzing event-related potentials (ERP). ERP is a measurement of the brain's response to a specific

sensory, cognitive or motor event. It is the electrophysiological response to a stimulus and is measured by electroencephalograph (EEG). An ERP study demonstrated that participants categorizing objects at subordinate levels of abstraction would produce an enhanced response[509] approximately 170 milliseconds after a stimulus onset, known as "N170," in the posterior recording sites (Tanaka, Luu, Weisbrod & Kefier 1999). The timing of response is a measure of the brain's computational power in the neuronal activity generated to process the stimulus, and thus, the time it takes to do so. So in this context, the brain's response is 170 milliseconds after exposure to the stimulus related to their expertise. Experts whose domain was birds, dogs, or cars, displayed similar enhanced N170 components when they categorized objects in their domain of expertise relative to categorizing objects outside their domain of expertise (Gautheir et al 2003; Tanaka & Curran 2001).

Even for non-experts, categorical training of novel visual objects can produce a similar N170 enhancement (Curran, Tanaka & Weiskopf 2002). The middle temporal region of the brain, specifically the fusiform gyrus, is particularly activated in neuroimaging studies during subordinate-level categorization (Gauthier, Anderson, Tarr, Skudlarski, & Gore 1997). This brain area is activated when both laboratory-trained experts (Gauthier, Tarra, Anderson, Skudlarski & Gore 1999) and real-world experts (Gauthier, Tarra, Anderson, Skudlarski & Gore 2000) view objects in their domain of

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[509] Technically, a negative brain potential.

expertise, suggesting that these specific brain processes are engaged in subordinate-level object categorization generally, and are recruited for perceptual expertise as well.[510]

Research particularly relevant to the processes of embodiment shows that perceptual learning can be acquired quickly (Ahissar & Hochstein 1997, 1998) and with little conscious awareness of the processes (Watanabe, Nanez, & Sasaki 2001). In Tibetan medical education, the very processes of memorization and recitation provide a nuanced methodology for these training processes. The process occurs relatively quickly. Likewise, students, as I have shown in my surveys and interviews, are largely unaware of these processes or that their perceptual skill is gaining greater precision and resolution. Knowledge is inculcated into their bodies—habituated into their modes of perceiving the world—by the education process itself.

During periods of perceptual learning, performance has been shown to be restricted to the narrowly specific conditions of training (Ahissar & Hochstein 1997, 1998), whereas expertise in perception has the quality of robustness and generalization to new contexts (Gauthier et al. 1998). The senses, like many systems, such as internet applications, navigation, and even the immune system, train in structured operating environments but gain flexibility and creativity in novel contexts via action/feedback loops. This spectrum of experience is readily seen in Tibetan medicine where memorization, recitation, simulation and clinical experience merge to cultivate perceptual expertise over time. When asked how one trains in diagnostics, my mentors continually

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[510] Converging evidence has been found across various studies: Ahissar & Hochstein 1997, 1998; as well as for perceptual expertise accruing over years of real-world experience: Johnson & Mervis 1997; Tanaka & Taylor 1991; or during concentrated training in the laboratory: Gauthier & Tarr 1997; Gauthier et al 1998.

responded that one memorizes, recites and gains experience—these *are* the processes that breed insight. In the initial stages of perceptual training in Tibetan diagnostics, recognizing a *rlung* pulse is related to specific instances where such a pulse was felt previously, with only coarse details of perceptual content that one uses to identify a *rlung* pulse. As greater experience developed, this sensorial experience can be applied to many contexts with greater nuance, detail, and fidelity.

As shown by Tanaka and his colleagues (2015), frequent exposure to a particular class of stimuli alone is insufficient to produce perceptual expertise. Hence the need for an organizing framework, explanatory or operational schemas, as provided in Tibetan Medicine. This also suggests an active process where the learner or user engages, enacts, and evolves the schemas and elaborates the hierarchical processing framework. The acquisition of perceptual expertise depends on "rapid classification of objects at specific, subordinate levels" (Tanaka et al. 2015:150). So we have two processes at play: the intense patterning of nuanced perceptual subcategorization and the refinement of the senses themselves. As the N170 enhancement in the medial temporal region with novices suggests, novel perceptual content is registered in similar brain regions for all perceivers, but how that perceptual content is engaged and reaccessed is distinct for experts. Perceptual experts not only recognize familiar stimuli but incorporate novel perceptual data into their established subordinate-level categories to create new subordinate-level categories according to their domain of expertise (Tanaka et al. 2015).

Expertise in auditory discernment: pitch, scale, tone and structure

Playing and listening to music are remarkably complex, culturally conditioned, natural human abilities (Zatorre et al. 2007). Producing and perceiving music requires a complex interplay of auditory and motor systems to follow a hierarchical rhythmic structure and to produce or perceive pitch at specific musical intervals (frequency ratios), whether singing a simple tune, playing an instrument in a concerto, or listening to either (Zatorre et al. 2007:547). The perception of speech itself also draws upon complex sensory-motor-cognitive processes and mappings (Poeppel & Monahan 2008). Similar to how the visual cortex maps the spatial organization of visual information in the retina, referred to as retinotopic mapping, the auditory cortex creates a topographic organization or mapping of a frequency-based representation in the cochlea known as cochleotopic mapping (Zatorre et al. 2007:549). The fundamental frequency is the frequency of a periodic sound corresponding to the lowest period or mode of vibration, usually the primary contributor to the perception of pitch (Zatorre et al. 2007:549). Meter is the hierarchical and temporal organization of musical output which usually extends over multiple measures or phrases. It is derived from patterns of strong and weak beats or pulses, corresponding to the strong beat of a rhythm's meter to which most people can tap along. A given culture of music will have a distinct set of rules governing the melodic, rhythmic and harmonic construction of music. Members in that music culture will have specific attunement to the respective meter, frequency, and harmonics of that music culture. I described earlier how, compared to our Tibetan peers, Ogawa, Inga and I had different melodies, rhythms and harmonic constructions for our recitations of the *Four Medical Transmissions* as well as the botanical names in the text written by the great

physician Khenrab Norbu. This is likely due to a different musical culture of syntax to which we were exposed to in development compared to our Tibetan peers. This is another form of passive embodiment of knowledge, or habituation of karmic imprints that reemerge when we engage a certain subject matter.

Although everyone processes musical sounds within a tonality schema, musicians use more detailed hierarchical levels in their processing (Bigand 1997) and brain responses (Besson et al. 1994; Besson & Faïta 1995; Koelsch, Schmidt & Konsok 2002). The brain activity of trained pianists when they listen to familiar pieces of music as well as when they play familiar pieces of music were examined for auditory-motor interactions by two fMRI studies. Both studies showed that the neural regions engaged during the listen and play conditions overlapped, specifically the premotor cortex, supplemental motor area (SMA) and planum temporale (Bauman et al. 2005; Meister et al. 2004; Bangert et al. 2006). A similar effect was seen for magnetoencephalography (MEG) in that activity in the primary motor cortex could be evoked when pianists listened to well-known music pieces (Haueisen & Knösche 2001), as well as increased motor excitability in a transcranial magnetic stimulation (TMS) study when they listened to piano music they had rehearsed versus a flute piece on which they were untrained (Rosenkranz et al. 2007). Auditory areas are also activated when pianists observe someone playing a piano keyboard (Haslinger et al. 2005). This demonstrates the tight coupling of auditory and motor systems generally, and particularly in expert musicians (Zatorre et al. 2007). This coupling occurs even with non-experts imagining hearing musical excerpts (Zatorre & Halpern 2005), and more emphatically when musicians

imagine performing (Meister et al. 2004; Langheim et al. 2002). Thus, both motor and auditory components are active in musical imagery (Zatorre er al. 2007:552). SMA and premotor regions seem to track rhythms spontaneously (ibid). Supplemental motor area neurons show selective activity for sequences of actions and intervals between actions in a sequence focusing on the encoding of procedural memory. Pre-SMA neurons code for rank-order and are more likely involved in procedural sequence chunking (Kennerley et al. 2004; Shima & Tanji 2000) in contrast to visual and semantic memory.

Structural changes in the brain also seem to coincide with and perhaps underlie expert music abilities. Structural magnetic resonance imaging has shown greater volume of the auditory cortex in professional musicians compared to non-musicians (Gaser & Schlaug 2003), correlated tightly with pitch perception ability (Schneider et al. 2002). Such musicians have greater grey-matter concentration in the motor cortices as well (Elbert et al. 1995), matching functional data of larger cortical representation of left hand digits for expert string players. Those who started playing earlier also showed larger representations, including a larger anterior corpus callosum (Schlaug et al. 1995). As described with memory formation, these anatomical differences indicate a sensitive period for motor performance, which is compatible with behavioral evidence (Watanabe et al. 2007). Diffusion tensor imaging (DTI) showed greater white-matter coherence in the internal capsules of expert musicians specifically related to the number of hours they practiced their instrument in childhood (Bengtsson et al. 2005). Since music elicits not only psychological mood changes, but also physiological changes like heart rate and respiration (Krumhansl 1997), these results indicate that expert musicians engage their

entire body differently; an emotive expression is cultivated with training of music ability (Jackendoff & Lerdahl 2006; Juslin 2005; Molnar-Szakacs & Overy 2006), with "afferent feedback enhancing the affective state" (Zatorre et al. 2007:555). Although such physiologic and psychological mood changes for expert musicians have not been studied, nor has integration of kinesthetic and proprioceptive cues with motor and auditory pathways, nevertheless music production and perception provide a rich basis for understanding perceptual expertise and the merging of input, processing and resultant cognitions.

Musical performance requires the binding of signals from multiple sensor signals at a neural level due to the integration of visual, auditory and tactile inputs and motor response (Zatorre et al. 2007). Musical expertise also requires precise timing which may promote fine tuning of the temporal window in which sensory signals co-occur and bind into a single coherent percept (Lee & Noppeney 2011).

Expertise in gustatory and olfaction senses

Wilson and Stevenson (2003, 2006, 2007) have shown that learning and memory play a central role in olfactory processing (Stokes et al. 2004:228). The olfactory system builds up a store of templates of receptors in the olfactory cortex that receive specific chemical patterns of receptor input. This allows the system to achieve greater nuance of odor distinction as more patterns are learned. Eight hundred different compounds may be recognized by three hundred different types of receptors at the olfactory epithelia. Relevant features, or chemical orientations and binding regions, are recognized by the

receptors and interpreted as specific odor objects (Stokes et al. 2004:228). However, Wilson and Stevenson stress that there is no presentation of a "coffee odor" per se. It is simply an encoded template, stored in long-term memory, of patterns of receptor activity associated with presentation of specific combinations of odorant chemicals (Stokes et al 2004:237).

Wine sommeliers are known for their expertise in recognizing these patterns, both through olfaction and taste. LaTour, LaTour, and Feinstein (2011) have evaluated various approaches to teaching novice wine drinkers to cultivate their taste. When novices are introduced primarily by perception, through tastings and printed tasting notes, the benefit for developing nuanced taste is less than when the learning is conceptual such that novices learn how the wine is produced and engage in discussions of different wine varietals in particular (LaTour et al 2011). LaTour and LaTour (2010) showed that novices have neither perceptual nor conceptual knowledge to be able to contextualize their experience or provide a language to describe it similar to the scaffolding by particular schemas and frameworks discussed earlier. Aficionados who have had much exposure to language terms to describe the wine will be unable to effectively use their language terms without conceptual frameworks in which to link the language. Highly developed language skills without conceptual frameworks can impair memory for the specific tastes (LaTour & LaTour 2010:689). Belcher and Schooler (1996) have worked on verbal overshadowing, when overexposure to verbalization impairs perceptual memory of a given object. They describe how this has been hypothesized to occur in situations in which domain-specific perceptual expertise exceeds verbal expertise since

"perceptual memories are a domain where language often falls short" (1996:231). This tends to occur most often for aficionados and not for experts or novices (LaTour & LaTour 2010:690), and has been described for faces and colors (Schooler & Engstler-Schooler 1990), visual forms (Brandimonte, Schooler & Gabbino 1995) and music (Houser, Fiore & Schooler 1995).

This effect aligns with an idea proposed by Whorf (1956) which suggests that humans view the world organized by their linguistic system rather than their objective perceptual lenses. For the aficionados, this seems to be true: their exposure to language inhibits their memory identification of the wine (LaTour & LaTour 2010:690). LaTour and LaTour (2010) show that aficionados lack the interplay between perceptual and conceptual knowledge that experts enjoy, and thus, may act more like novices in their ability to learn from experience (691). In creating experts, sommelier training programs focus on enhancing sensory training by developing the perceptual abilities through tasting techniques that are accompanied by general knowledge linking to those characteristics (LaTour & LaTour 2010:691). The conceptual knowledge about the origin of those characteristics enhances the flavor detection and increases discernment in the experts' tasting experience (Hughson 2003). They use the example of experts tasting a cabernet sauvignon and searching for notes of bell pepper, which is a feature typical of wines from those grapes. Solomon (1997) argues that as one gains expertise, the individual moves from a more perceptually to more conceptually driven recognition of feature salience. Many wine researchers recognize that sommeliers have a very dense lexical system (Goode 2007). This allows sommeliers to "recruit more brain areas to help with a

complex task. Experienced wine tasters pull in new brain areas to help with the analysis of sensory stimuli" (Goode 2007:89). However, perceptual expertise can markedly exceed verbal expertise (Melcher & Schooler 1996: 232) and thus, sommeliers' ability to describe their perceptual experiences rigorously may be due to a developed vocabulary more than a linguistically-reliant development in perceptual skill. However, Melcher and Schooler's research suggest the opposite: "Overall, the perceptual communication data strongly suggest that wine experts learn to pay selective attention to describable features of wines, whereas non-experts are less able to do so" (1996:234). The perceptual and verbal expertise need to each be developed, otherwise the verbalization of a perceptual memory can be disruptive when perceptual expertise exceeds verbal expertise (Melcher & Schooler 1996:234), as with the aficionados.

Likewise, LaTour and LaTour (2010) note that experts use more "specific sensory terms in their tasting notes," resulting in greater memory accuracy than either novices or aficionados (691). As Jonathan Hope, a semiotics expert, and Pierre-Louis Patoine, a scholar of neuroscientific approaches to literature, suggest the following:

> One of the main differences between a sommelier and a novice concerns the expert's capacity to arrange and normalize his sensory experience through linguistic and cognitive operations, a task demanding that he focuses his attention on specific aspects of his activities. This most likely could, but does not, take place in the novice. This focusing or piloting of attention determines in part the actual conscious experience we have of this activity and can be facilitated by structured language. (2009:74)

In this insight from their collaborative research, Hope and Patoine succinctly describe a process akin to the work of *apoha,* insofar as selective attention ignores what it deems non-relevant input. The expert, like the novice, receives the same sensory data in a cognitive moment of perception. However, the expert negates the perceptual data that is not relevant to making a perceptual judgment and articulating that perceptual judgment for the purpose of distinguishing the kind of wine. Structured language that links to the purpose of distinguishing fine nuances of detail within the complex chemical odor space of the wines, allows for sommeliers to articulate minute differences between wines.

LaTour and LaTour show that specific sensory terms can either enhance learning or impede learning among aficionados (2010:693). Without perceptual training coupled with the specific sensory terms and links to the particular conceptual contexts from which such aspects arise, expertise cannot develop. They describe that the "perceptual/ conceptual integration," encouraging comparisons between developed sensory language and one's own perceptual experience, is important to the learning process in creating expertise.

Tactile expertise: developed haptic skill

Research on Braille reading suggests that units larger than the individual character cannot be assessed as one percept; however, recent studies have shown that Braille represents a form of tactile priming extending current knowledge regarding implicit memory into the tactile domain (Hamann 1996:287). Processing of Braille retains the same qualities of stem-completion priming as those of visual and auditory modalities.

Thus, pure tactile representations are compatible with understandings of implicit memory (Hamann 1996:287). As experience with haptic skill develops, the cortical somatosensory representation of the fingers grows and reorganizes in a use-dependent manner (Sterr et al 1998). As cortical reorganization develops in dependence upon use, related perceptual and behavioral capacities also develop (ibid).

Expertise in reading (and reciting)

A common theory previously prevalent among neuroscientists was that our brain needs to "sound out" words when we see them. However, new research shows that although beginning readers must sound out words as they read, advanced readers recognize words visually, no longer accessing brain areas related to the phonological sounds (Glezer et al 2016). So what happens when one deliberately articulates the sounds of words that one already recognizes visually? Is the brain allowed to explore more conceptual relationships of content?

The temporal lobe manages phonological recognition, decoding and discriminating sounds. Broca's area in the frontal lobe controls speech production and language comprehension. The angular and supra marginal gyrus connect various regions of the brain to assemble words from individual letter shapes. The collections of nerve fibers of white matter myelinated for speed of transmission, such as in the arcuate fasciculus, help integrate learning and function among areas. Stanford neuroscientists Yeatman, Dougherty and colleagues (2012) identified that white matter tracts in the arcuate nucleus are primarily responsible for connecting language centers in the brain,

and the interior longitudinal fasciculus links the language centers with visual information. Strong readers have strong signals in both tracts, and strengthen over years in child development for stronger readers; weaker readers experience the opposite pattern.[511]

Expertise in performance (chess, dance, synchronizing the senses)

Although hailed as the ultimate test in cognitive ability, expertise in chess seems to operate similarly to word processing. Chess champions describe simply "seeing" the right moves (Adriaan de Groot 1940). The narratives used by chess experts in describing their thought processes for making certain moves sound perceptual: "the rook was exposed" or the "pawn structures were off" (Foer 2012:64). They see "systems of tension" and "chunks of pieces," not the 32 pieces of the entire board (ibid). Likewise, they could only remember the positions of seven pieces on average.

Thus, a critical aspect of expertise in memory arises: we do not remember isolated facts, but things in context. Magnetoencephalography (MEG) shows that higher-rated chess players have greater activation in frontal and parietal cortices when looking at the board, demonstrating greater use of long-term memory. They use the memory of past boards as a storehouse of contexts to apply to the present ones. Lower-ranked players see the board as new (Foer 2012:66).

De Groot's studies of chess players and expertise intersects with the conclusions of Ericsson. De Groot assumed that the insights from expertise in chess applied to many

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[511] Theories for developing speed-reading capacities focus on techniques for getting words more efficiently to the fovea, a minute area in the center of the retina that gives us focused vision to identify shapes, such as letters. Shapes that are not centered on the fovea can slow the eyes' characteristic movements called saccades in an effort to interpret the shapes.

fields: “the field of shoemaking, painting, building, [or] confectionary” and is due to accumulation of “experiential linkings” (De Groot 1940; Foer 2012:66). Ericsson describes expertise as “vast amounts of knowledge, pattern-based retrieval, and planning mechanisms acquired over many years of experience in the associated domain” (Ericcson 2003). Thus, great memory is not a “by-product of expertise,” it is the “*essence* of expertise” (Foer 2012:66). In the same way, the Tibetan tradition defines great intellect based on one’s ability to memorize.

Ericsson has shown in his research that it takes about ten thousand hours of training to achieve expertise, or world-class status in a given field (Foer 2012:54). Similar estimates are made in Tibetan medical pedagogy with memorization. Two hours per day bare minimum of memorization, with most students completing an average of four hours per day, means 3,650 hours bare minimum to 7,300 hours average over five years; with those students who excel in the oral examinations completing closer to 10,000 hours of training during their curricular years. Most of my mentors described continuing their memorization and recitation practices daily—some up to four or five hours per day still in their professional career. Likewise, in Tibetan Buddhism, similarly large numbers are proposed for proficiency of certain practices: 100,000 repetitions[512] of a given visualization, technique for generating compassion, and so forth.

Thus, in Western medical education, if students are no longer required to build and expand their memories, relying on digitalized information and metrics instead, one might hypothesize that medical expertise would also take a significant hit. “Our

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[512] འབྱམ་ཞིག

memories are always with us, shaping and being shaped by the information flowing through our senses, in a continuous feedback loop. Everything we see, hear and smell is inflected by all the things we've seen, heard, and smelled in the past. […] In ways as obscure as sexing chickens and as profound as diagnosing an illness, who we are and what we do is fundamentally a function of what we remember" (Foer 2012:67).

Beyond greater capacity to make use of chunking in working memory among experts, heightened awareness also seems to be an important characteristic of expertise. In analyzing the behavior and brain structure of fighter pilots compared to healthy controls, researchers found structural alterations in the white matter of frontal and parietal lobes, but also enhanced response gain to both relevant and irrelevant stimuli (Roberts et al. 2010). Researchers theorized that the expertise in performance of optimal cognitive control among fighter pilots may be mediated by heightened sensitivity to various perceptual input regardless of its significance to flight path, plane control or other tasks relevant to their performance.[513]

As Cooke and Bartha (1992) have described among psychology students, the use of mental metaphors increases with expertise. Psychology is a domain in which the recognition and use of metaphors have been widely recognized (Cooke & Bartha 1992). The use of metaphor as a common human construct of the mind is seen to rest on a basic

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[513] Another area of expertise in performance that draws on similar pedagogical tools of metaphor as Tibetan medicine is dance. Metaphors pervade the way dancers and instructors think about and describe the sensations they cultivate in their body to achieve certain movements, expressions, poses and positions. As Thibodeau and Boroditsky (2015) described metaphors in how people respond to crime, the very metaphors used in communication cultivate a felt sense and response to the topic. For example, with describing crime as beast that one must fight, people were more likely to support increasing the police force. However, in describing crime as a virus that plagues and infects cities, people were more likely to support measures to diagnose and treat crime through increasing social reforms (Thibodeau & Boroditsky 2015:1).

assumption that metaphors establish correspondences between concepts from disparate domains of knowledge, promoting a form of cross-modal pattern recognition. Even in the field of psychology, the use of metaphors among psychologists over the last century provides a window into the profession's theoretical framework that can be tracked to see how the field is understanding the mind in terms of structural-functional dynamics, behaviorism, information processing and so forth (Gentner & Grudin 1985). As discussed above, the richness of metaphoric language by sommeliers increases with wine expertise (LaTour & LaTour 2014). I argue that metaphors provide a perceptual manifold vis-à-vis a mental image to layer meanings with perceptual richness, training the senses to be more astute, and the knowledge gained from observations and inferences to be more rich in detail and insight into the related causal efficiency. As Cooke and Bartha (1992) describe, metaphorical explanations are more prevalent among individuals who are experienced in the domain and in situations in which literal explanation is insufficient or unavailable (215). This is particularly relevant for domains in which perception plays such a major role.

Expertise in compassion shaping expertise in perception

Many aspects of our primary emotional responses are learned (Kandel 2000:995). During this learning, visceral feedback plays an important role as do the association and narratives that provide a cognitive interpretation of emotional states (Kandel 2000:995). Thus, the emotional response of care, concern, and compassion for another would be a learned response to another being's suffering, and the narratives associated with such a

response would either heighten or diminish such a response. Compassionate response would likewise need to be developed over time with multiple sources of experience and input to the need for such a response and its effect. An expert in compassion would require techniques for developing and sustaining such compassion over time.

In looking at how cognitive neuroscience characterizes expertise and the processes of skill development necessary to achieve expert level performance, we do not see inquiry into the role of cultivating empathic values with the subject or content in which one is gaining skill as part of the developing process in gaining expertise, nor the role of role models as illustrative exemplars of both process and outcome. However, we can see both aspects at play in the descriptions. A birder does not become an expert without a sincere interest in birds, a musician does not become a virtuoso without delighting in the creation of his music, and a physician does not become an expert diagnostician without caring for the patient regardless of how much he or she may enjoy working through the dynamics of the diagnostic mystery itself.

I now re-visit Dharmakīrti's *pramāṇa* theory to look at how his perspectives on perception and valid cognition relate to expertise. Subsequently, I will discuss how *pramāṇa* theory informs the role of critical rituals, such as Yuthok Nyingthik and Medicine Buddha practices, for Tibetan physicians in becoming experts.

Part III. Expertise in Dharmakīrti's **Pramāṇa** *Theory*

In cognitive neuroscience, when someone achieves a level of mastery over a skill, the brain regions activated for the execution of that activity, particularly the perceptual experience of heightened awareness and the enacted response, mirror what Dharmakīrti describes for perceptual expertise. For Dharmakīrti, one can use contemplative techniques to infuse the mind with a given concept (e.g., antidote to fixation on self) until it is completely "inculcated" (*sātmibhūta*) in one's mental continuum, similar to what I discussed earlier regarding the conceptual-perceptual dialectic. In Dharmakīrti's theory of concepts, a concept itself can be taken as a mental event, which qualifies as a particular and, thus, an object of perceptual cognition.

Dharmakīrti's *pratyakṣa* philosophy, or theory of perception, demonstrates the employment of an instrument of valid cognition in order to assess physiological cues for meaningful diagnostic application in the Tibetan medical nosology. He describes the importance of a training process that cultivates skills in perception and a rigorously developed understanding of causality to properly employ inference. Psychological anthropologist Tanya Luhrmann's account (1989) of the sensitization process for Wiccan adepts in England is similar. One becomes a master specialist through this process. Luhrmann describes the process as a gradual sensitization to specific content:

> Most of the learning involved in becoming a specialist is not self-consciously verbalized; it is an unacknowledged accretion of knowledge and assumptions, ways of seeing and ways of making sense. People are often innocent of the changes in their own style of perceiving events, interpreting their actions, and organizing their memories. Many of these changes creep in slowly as the neophyte becomes a skilled hand at practice. The

> new ways of noticing, encoding, remembering, perceiving, not only alter the way events are observed, but also affect which ideas and theories seem plausible. (1989: 116)

Thus, through the process of what and how one is seeing and experiencing, one is literally changing the way one sees, experiences, and makes sense of the world. Understanding Dharmakīrti's approach also gives a greater understanding for what practices such as the Medicine Buddha and Yuthok Nyingthik are doing, which I will discuss shortly.

As described in the previous chapter, for Dharmakīrti, a perception (*pratyakṣa*[514]) occurs when there is non-conceptual content. A resultant concept or perceptual judgment can occur, but after the initial non-conceptual perception. So in the example of pulse diagnosis in Tibetan medicine, Dharmakīrti would look at the act of perceiving a pulse as cognizing the non-conceptual content of the pulse itself—the aspects that manifest to the perceptual cognition, all the perceptual sensory data that the particulars of the pulse have the interactive potentiality to create. However, any judgment of it being, say a *rlung* pulse, would become a conceptual cognition.

Yogipratyakṣa, or yogic perception, allows for abstract concepts[515], that is, concepts like impermanence, emptiness of inherent self-perpetuating existence, and so forth, to become direct perceptions. Thus, it provides a greater context for the conceptual-perceptual dialectic I described earlier. Habituating one's self to specific abstract concepts allows one to cognize these aspects of reality directly. In the Tibetan medical example,

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[514] མངོན་སུམ།

[515] Such as the Four Noble Truths, which are: 1) Understanding that life is suffering; 2) Understanding the origins, or roots, of sufferings (i.e., ignorance); 3) Understanding that one may bring cessation to suffering; 4) Understanding the paths to ending suffering (Hopkins 1997).

the training process of diagnostics can habituate one to perceive impermanence more readily by habituating the conceptual understanding of constant change in the individual for whom one is reading pulse, fluctuations of homeostasis, their mental influences, social interactions, consumed food, shifts in environmental context, bodily process and trajectories of the illness itself, until it becomes perceptual.

Dunne describes Dharmakīrti's theory of yogic perception as a "process that is designed to inculcate transformative concepts into the mind through an intense, vivid and nonconceptual experience that arises from learning, contemplating, and meditating on those concepts" (Dunne 2006:500). I will not address Dharmakīrti's theory of yogic perception in full here, but merely aim to show that Dharmakīrti's approach to *pramāṇa* theory provides foundations from which expertise in the Tibetan medical context is understood. Understanding this contemplative theory allows us to see training in a system of physiological cues showing signs of suffering and distress for diagnostics of a patient as a subject of meditation for Dharmakīrti, and an appropriate teleological context in which one could gain expertise. The "movement from the conceptual to the nonconceptual" (Dunne 2006:500) is structured by the telos of returning a patient to a state of health, and ultimately eliminating any suffering.

Dharmakīrti's *pramāṇa* theory applies to training the senses for diagnostic applications in cultivating expertise. The Tibetan medicine pedagogical model uses memorization-recitation-metaphor to induce visualization. These visualized experiences and metaphor stanzas are integrated with clinical experience such that it forms a meditative practice of learning the perceptual cues, or aspects that one must pick up when

examining a patient's pulse, urine, body and so forth. These aspects relate to the interconnection of causes and conditions generating imbalances, the environmental and social interactions, influences of food and diet, medicinal qualities, therapy characteristics, and so forth. These aspects are conceptual in that they describe qualities such as smooth, rough, cold, hot, dull, sharp, heavy, light, sticky and so forth which relate to aspects of the pulse or physiological phenomena that one is assessing diagnostically. These qualities arise from perceptual experience and are related through inference to the diagnostic etiology and theoretical framework of the medical system. Through memorization, recitation, metaphorical imagery, and clinical experience, the physician contemplates each aspect that exemplifies how a sentient being is affected by the various potential causes and conditions of illness, its environment, its mental patterns, its social relations and so forth. As Dharmakīrti describes, the contemplation involves reasoning, assessment of causality. As the contemplation and reasoning reaches its height, an affective experience of understanding results, which is an embodied knowledge event. Thus the training involves imbibing aspects and employing reasoning to use the conceptual to heighten perceptual acuity and inference.

In various meditation practices, visualizations are performed and embodied, drawing upon habituation of past experience—perceptually, conceptually, physically, emotionally—and recognizing the absolute uniqueness of each new moment. Each pulse, each urine, each patient case presents itself as unique and particular. Because of the conceptual patterning of the various illness symptomologies, etiologies, constitutions, and presentation variations, this contemplative activity applies the conceptual and reasoning

mind to engage in perception[516]. As in Dharmakīrti's *apoha* theory, the cognitive process carves out perceptual content by negation to create discrete objects of diagnosis to track —the classic conceptual metaphors for a given pulse become perceptual.

One can link present content of a pulse signature to past events through recognizing that past events have the interactive capacity to present similar qualities and patterns. That is, the past events and the present event are never the same. Each has absolutely unique content. A *rlung* pulse is not a *rlung* pulse is not a *rlung* pulse. One may recognize that all instances of a *rlung* pulse manifest through a similar cascade of causes and conditions such that which presents itself as a *rlung* pulse in one moment compared to another is that they have a commonality of that which they are not causally linked. Their similar interactive capacity is based on the common exclusion of interactive capacities to which they are cognized to not be related. That is, "one constructs a sameness for a class of individuals on the basis of their difference from other individuals" (Dunne 2006:502). The culmination of conceptual content dissolving into direct perception occurs in the experience of looking at the absolute particularity of the pulse presentations themselves[517].

Expert physicians in Tibetan medical history and in my interviews with mentors describing the accounts of the great contemporary experts, many great expert physicians describe a sudden "knowing" of the illness, a seeing of the causes leading to the

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[516] For physicians, this leads to a point where the physician "sees the illness," as Mipham describes in extensive practice and expertise

[517] However, in Dharmakīrti's account, perception can only occur in the present as a moment particular event. Since diagnostics must necessarily link perceptual data to past caricatures and future possibilities, this temporal linking process would disqualify diagnostics from Dharmakīrti's yogipratyakṣa and wholly categorize it as inference.

imbalance. This represents a minimized form of conceptualization. The *Explanatory Transmission* describes: "First, it is taught that the object of healing is for the sake of the body, and that where one applies healing is the illness that arises from that [body]"[518] (TII, Ch 1:36). As seen in the previous chapters, the body here represents the mind-body complex, the five aggregates, the bodily constituents, the three *nyépa*, the mental afflictions and all the related constituents of this form. Illness refers to any imbalance, suffering or distress in mind or body.

Perceptual vividness can occur in memorization and recitation since the metaphors invoke a perceived experience, making the memorization-recitation experience phenomenologically visceral. Thus, the perceptual and the conceptual become dialectically related—-mutually informing one another, as in Boroditsky's language-perception dialectic model discussed earlier (Boroditsky 2011). In diagnosis, as well, patterning of clear qualities in pulse, urine, tongue and overall appearance of the patient provide initial conceptualization that need to be transcended to gain a perceptual experience of the illness object.

When identified as "some nature (*rūpa*) distributed over a class of particulars, a concept is a universal; but considered as a mental event, the concept is a particular" (Dunne 2006:513). Thus, as the Tibetan medical text is recited, the conceptual framework that is articulated in the text induces mental events through metaphor, poetic language of imagery allowing for a vivid experience of the content. Such vivid phenomenal experience also forms a dialectic with the clinical experience of perceptual

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[518] དངོས་གསོ་བར་བྱ་བའི་ཡུལ་བསྟན་པ། གང་གི་དོན་དུ་གསོ་བ་ལུས་དང་ནི། གང་གསོ་བར་བྱེད་བའི་ནད་དུ་བསྟན། (TII, Ch 1:36).

cognition of physiologically cues from the patient, and inferring the content into the system of recognizing specific illness and determining treatment.

I now turn to discuss how *pramāṇa* theory informs the role of critical rituals, such as Yuthok Nyingthik and Medicine Buddha practices, for Tibetan physicians in becoming experts.

Part IV. Buddhist practice as cultivating medical expertise

In the transmogrification of the physician into an enlightened being, the physician not only cultivates certain dispositions and mental qualities, but undergoes physical changes, both coarse and subtle that are meant to aid the physician's perceptual capacities. This is not exclusive to the Buddhist Tantric tradition, but can be seen in Hindu Tantra, Kashmiri Śaivism, Siddha traditions, and so forth (White 1998, 2000, 2006; Samuel 2008; Wedemeyer 2014).

An early and widespread metaphor in Buddhism describes the Buddha as the doctor, suffering beings as patients, and the dharma—both the teachings and the realization provided by the teachings—as the medicine. In this model, a number of questions arise that have been addressed by Buddhist thinkers over the centuries. One particular question is relevant to our analysis in this section: the question of proper diagnosis. How have we correctly identified the nature of the suffering and its cause for a given being? A second question relates to prognosis: can the suffering be eliminated? Dharmakīrti's contribution to addressing these questions is largely epistemological and has been uniquely and highly influential in subsequent accounts (Dunne 2006:498). His

theory of *yogipratyakśa*[519], yogic perception, is central to understanding this approach, and provides understanding as to why these Buddhist practices engaged by Tibetan medical physicians are seen as highly efficacious in producing diagnostic skill and insight. A detailed account of *yogipratyakśa* is beyond the scope of this work; however, this section will describe some of the distinctive features related to Buddhist practices[520], such as for Medicine Buddha and Yuthok Nyingthik, used by Tibetan physicians to cultivate both diagnostic capacity and therapeutic efficacy.

In Dharmakīrti's account, he suggests a sequence of contemplative practice: (1) begin with instructions from a trusted source, that is, a guru and the scriptural sources of the trusted source; (2) apply reason to those instructions so as to thoroughly learn the causes of suffering and the antidotes for its elimination; (3) cultivate the antidotes to suffering, ignorance and delusion; (4) repeatedly engage in practice of cultivation which, he asserts, will lead one to clarity about the objects to be cultivated while also developing an acuity of mind. It is through that clarity and acuity that one is able to eliminate the cause of suffering even at the most subtle imprint level (Dunne 2006:506). Here, we see the procedural methodology in which Dharmakīrti frames meditative practice:

> [Some] adepts, having apprehended objects (*artha*) through a cognition (*jñāna*) born of learning, and having established those objects through reason and a cognition born of contemplation, then meditatively cultivate [a realization of] those objects. When the meditation reaches its culmination, those adepts have a cognition with a vivid appearance, as in the case of fear [induced by a dream].

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[519] རྣལ་འབྱོར་མངོན་སུམ།

[520] Other than a physician's personal practice deity, *yidam*.

> The adepts' cognition is a perception that is a reliable awareness (*pramāṇa*); it is nonconceptual and has a non-erroneous object.[521] (Dunne 2006:507)

Dharmakīrti emphasizes a specific cognitive process, a sequence of cognitions, which is induced first by learning, then by contemplating, and finally by meditating[522] (Dunne 2006:507). This is quite similar to the classic depiction by Vasubandhu in his *Abhidharmakośa* that we as students heard as *tö*, *sam*, *gom*[523], meaning listen, contemplate and meditate, which means literally, to familiarize. Almost any class I took at MTK and SLL referred to this approach. It became a type of mantra for the learning process: *tö*, *sam*, *gom; tö*, *sam*, *gom; tö*, *sam*, *gom*. They are known as the three types of discernment or "wisdom" (*jñāna*). Vasubandhu's verse reads: "Of good ethical conduct (*vṛttastha*), as one who has learned and contemplated [the truths], one applies oneself to the meditative cultivation [of their realization]" (as quoted in Dunne 2006:507[524]). Vasubandhu elaborates:

> One who wishes to see the Truths from the very beginning guards his ethical conduct. He then studies the teachings (*śruta*) that are conducive to seeing the Truths (*satyadarśana*), or he listens to [teachings about their] meaning. Having studied or listened, he contemplates. And having correctly contemplated, he applies himself to meditative cultivation. In a state of meditative concentration (*samādhi*), in him arises the contemplation-born discernment on the basis of his study-born discernment. And on the basis of his contemplation-born discernment, the cultivation-born discernment arises in him. (as quoted in Dunne 2006:508)

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[521] Dharmkīrti continues, "That reliable perception is, for example, the seeing of the Noble Truths (*āryasatyadarśana*), as I explained in the *Pramāṇavārttika*" (Dunne 2006:507).

[522] *Śrutamaya-*, *cintāmaya-*, and *bhāvanāmayajñāna* (Dunne 2006:507)

[523] ཐོས་བསམ་སྒོམ།

[524] Dunne cites: *Abhidharmakośa* 6.4cd: vṛttasthaḥ *śrutacintavān bhāvanāyāṃ prayujyate*

In this account, there is a progression of understanding through names, symbolic expression, and linguistic form; then onto deeper conceptual meaning through contemplation; and then into "meaning without depending on symbolic expression," that is non-conceptual understanding. As Dunne describes, the movement from conceptual to non-conceptual could be about ostention (Dunne 2006:509), that is, the act of showing, pointing out, exhibiting. However, in the case of the Noble Truths, impermanence, selflessness, and emptiness do not exist as real things in the world (ibid) so they cannot be revealed through ostention. What makes an adept's perception exalted is not the content's ontological status, but instead, that, "when the content is brought into the mind in an intense, visceral fashion, it induces salvific effects" (Dunne 2006:509). Here, again we see purpose as serving a critical role in determining what knowledge is valued through perceptual induction. Thus, perception induced by meditating on a concept, namely the Four Noble Truths, causes changes in one's mental dispositions which lead to fewer afflictive emotions (*kleśa*) (Dunne 2006:515) and therefore less proliferation into the *nyépa*, a clearer more concise instrument for implementation, and less suffering and greater happiness for the physician herself.

As discussed above, though important for Tibetan medical diagnostics and the Buddhist practices in which physicians engage, Dharmakīrti's theory of yogic perception downplays the notion that through spiritual exercises, an adept gains extraordinary sensory abilities in order to emphasize the soteriological core of Buddhism in the Four Noble Truths. However, he readily acknowledges the existence of extraordinary abilities and seeks to account for them (Dunne 2006:504). In Buddhist narrative literature as well,

Buddhist texts refer to the cultivation of extraordinary powers through spiritual practices. For example, the list of ten cognitions (*jñana*), including the power of "knowledge of others' minds" (*paracittajñāna*) is included in the seventh chapter of Vasubandhu's *Abhidharmakośa*. Development of these capacities are relevant for Tibetan medical diagnostics and epistemology so eventually a physician can gain clear diagnostic insight by a single "glance" of the patient.

As students of Men-Tsee-Khang, we were given the opportunity to receive the Medicine Buddha empowerment and instructions several times throughout our education. The first opportunity was given by His Holiness the Dalai Lama, where we were given special seats at the main temple. The second opportunity was provided by the abbot of Namgyal Monastery who had resided in Italy for many years prior and had just returned to Dharamsala. The next time was by Dzogchen Ganor Rinpoche as part of a large installment of transmissions, teachings and empowerments with special empowerment of the medical instruments.

As described above from the medical ethics chapter of the *Explanatory Transmission,* the physician is expected to visualize herself as the Medicine Buddha with all the associated implements, qualities, wisdom, insight, compassion, capacities, and activities and so forth. This transmogrification of the physician provides diagnostic precision and treatment efficacy such that the physician is said to be able to eliminate all imbalances of the three *nyépas,* all disease, all mental poisons and all obstacles.

Before I even entered Men-Tsee-Khang, when I was walking down the hill to Amchi Khenrab's office for daily lessons in the *Four Medical Transmissions*, I had the

opportunity to receive one of the other most important empowerments in the "becoming" of a Tibetan doctor: the Yuthok Nyinthik. I had no idea how important it was, or that it would be a coveted and rare empowerment for Tibetan doctors, but I am grateful to my professor's nun friend who took me under her wing and made sure I received the entire initiation and blessing.

Although not explicitly stated in the *Four Medical Transmissions*, the Yuthok Nyingthik as a spiritual practice and, as part of the transmogrification of the physician, plays a central role in providing the means for developing expertise in Tibetan medicine. As Frances Garrett has argued, it is an "alchemical practice [that] forms the central nexus of connection between Tibetan medicine and the Buddhist Nyingma tradition" using esoteric Buddhist yogic and contemplative practices to enact the alchemical transformation (2009:207). One of the central places that its enactment may be viewed more publicly is in the Accomplishing Medicine[525] (*mendrub*) practice that confers a particular efficacy to the medicine that is created and blessed during the ritual. However, its practices are considered fundamental for *amchis* in their own practices as well as in the conferment of blessings for medicine professionally.

The *mendrub* practice is described as being integrated into the medical tradition by Yuthok Yonten Gonpo (1112-1203[526]) by Darmo Menrampa Lobsang Chodrak[527] (1638-1710), a renowned medical scholar and head physician to the Fifth Dalai Lama, who wrote Yuthok's biography. As one of my teachers Jamyang Gyatso had explained to

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[525] སྨན་སྒྲུབ།

[526] Dates from Frances Garrett (2009:212).

[527] དར་མོ་སྨན་རམ་པ་བློ་བཟང་ཆོས་གྲགས།

me, the monthly *tsok*[528] that we do at D'asa Men-Tsee-Khang came from the Lhasa lineage and was developed especially for Men-Tsee-Khang. The empowerment had been given several times in the Dharamsala region by Kongtrul Rinpoche, Tsedrul Rinpoche (insert from transcript), and most recently by Tai Situ Rinpoche in 2017, he said, and performing the monthly *tsok*, a monthly ritual offering to the deity and retinue, and reciting the text was enough to maintain the vows.

As I learned more about the Yuthok Nyingthik while I was in Amdo and through the activities of a Tibetan tulku-doctor who was making the Yuthok Nyingthik popular in the West, I realized that the practice had elaborate stages in which to train. I was also surprised to see that one could do short intensive retreats for the preliminaries and many parts of the generation and completion stages and still achieve the *siddhis*, qualities achieved from the practice, a unique characteristic of this practice since it was made for Tibetan doctors who do not have extensive time to engage in long accumulations.

Perhaps one of the difficulties at D'asa Men-Tsee-Khang is that we did not have a lama who was also a Tibetan doctor as part of the institute who could lead these practices and allow for *amchis* to further develop their individual practice. For example, in Lhasa, when the *mendrub* was reinitiated for the first time since 1955 (Garrett 2009:208), it was the Sakya lama, Tsultrim Gyaltsen, who was also a highly regarded physician who led the ritual. D'asa Men-Tsee-Khang carries the name of the 14th Dalai Lama, and he is considered its patron and head lama; however, there is not a physician within MTK who is also a lama. The *tsok* is led by the disciple of Chatral Rinpoche, who was a great

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[528] ཚོགས།

Nyingma master. When a series of empowerments and transmissions was held at Men-Tsee-Khang during my second year, the lama uncle of one of the doctors, Dzogchen Ganor Rinpoche, was brought in for the occasion. He decided not to give the Yuthok Nyingthik at that time perhaps because of lineage issues. However, he did give a special Medicine Buddha empowerment that also empowered the ability to use all the medical instruments.

The Yuthok Nyingthik practice, similar to many other tantric practices in Tibetan Buddhism, is understood to confer extraordinary capacities to the practitioner as well as the capacity to provide them to others. For example, Yuthok's father described that by practicing the *bdud bdud sman grub* that "You will certainly be liberated from illness, evil influences, disasters and malignant spirits[529], and you will possess magical powers, clairvoyance, power and strength" (Garrett's translation, Garrett 2009:214; Jowo Lhundrub Tashi 2005:170(?1982 version); Rechung 2001:238). Likewise, for physicians, the capacities are particularly pertinent. In receiving the teachings from his father, Yuthok Khyungpo Dorje, described his patients' bodies becoming transparent, "revealing all illnesses as clearly as one can see 'an olive in the palm of the hand'" (Garrett translation, Garrett 2009:214; Jowo Lhundrub Tashi 2005:71(?1982 version); Rechung 2001:185). Here, we see the teleological context of how expertise is formulated: advancement in spiritual practice confers supernatural as well as natural skill. Engaging in textual study, gaining repetitions in diagnostics and so forth are critical, yet with this is achievement in spiritual practice which is said to give even greater benefit of perception to see illness,

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[529] ནད་གདོན་བར་ཆད་བཞེགས།

suffering, obstacles and dis-ease, as well as the means to alleviate such misery and distress.

The role of ritual

Religious studies scholar Peter Collins notes that the failure to include the interpretations of practitioners in accounts of 'ritual' may result in "an unnecessarily crude representation of social life" (Collins 2005:323). In his work of ethnography in Quakerism, he presents Turner's standard definition of 'ritual' as "prescribed formal behavior for occasions not given over to technological routine, having reference to beliefs in mystical (or non-empirical beings or power" (Turner 1969:15). Collins argues that for Quakers, the definition would be something more like its opposite in that it cultivates an empirical experience, not only a technique in a new way of looking but the manifestation of it (2005:324). He also argues that for Quakers, 'ritual' is multifunctional, attuned to the multiplicity in human understanding itself (2005:325).

In our Tibetan medical education, we engaged in innumerable rituals, from daily prayers in the morning, to hierarchies in who sits where in the classroom, how teachers are addressed, what discussions are private versus public, and many formal rituals for transmitting and cultivating knowledge. The ceremonial feasts called *tsok,* which I mentioned earlier, occurred monthly, providing windows into the greater Buddhist epistemological context within which Tibetan medicine is situated. It also gave us insight into the ritual technologies expected of us as Tibetan physicians if we seek to develop our skill and expertise. The *mendrub* practices also showed the degree to which potency,

nüpa, of a medicine is contingent upon these types of technologies, or ritualized practices. Ritual provides a vehicle for enaction, cultivating body through a synthesis of narrative, purpose, emotion, perspective, and a transformative means through which to enact these dimensions in empirically new aways. As Tibetan medical practitioners, the Yuthog lineage and the Nyingma Treasure tradition demonstrate an intricate relationship between the pharmacological and ritual methods of healing for our profession (Garrett 2014:180).

Common and uncommon: medical versus Buddhist aims and techniques

As Gen Jamyang described to me, "One does not need Buddhist practice to be a Tibetan medical physician. Tibetan medicine aims to heal the body. However, just like a strong understanding of science, it will allow you to benefit many more individuals than without it." He continued, "Tibetan medicine is considered a 'common'[530] knowledge field. Buddhism is considered a special, or 'uncommon'[531], knowledge field, which means not everyone will cultivate this kind of knowledge. Depending on how broad one aims to benefit others, [that intention] will determine what skills one seeks to develop. Buddhist practice and ritual allows one to cultivate one's skills in compassion[532],

[530] ཐུན་མོང་བ།

[531] ཐུན་མོང་མ་ཡིན་པ།

[532] སྙིང་རྗེ།

altruistic motivation[533], and a desire to relieve the suffering of all sentient beings and gain realization[534]. These are essential for being able to benefit others on a vast scale."

In acknowledging the role of scientific knowledge, he said, "Similarly, excellence in scientific understanding is important for Tibetan medicine because it draws upon detailed knowledge of anatomy and physiology, pathology and clinical chemistry. So if one wants to be a better doctor, one will train in science and gain a good understanding of biomedical approaches to health and illness." Janet Gyatso (2015) made the case for Tibetan medicine's role in fostering empiricism in Tibet and a scientific sensibility. Although she focused on the seventeenth century era when Desi Sangye Gyatso and the great Fifth Dalai Lama came to power, Gen Jamyang's perspective, like many of my other teachers, saw that the approach to Tibetan medicine has been empiricist from the beginning—as a naturalist science aimed at alleviating the illness and suffering of the body. Thus, Gen Jamyang, Gen Rinchen, Gen Khenrab and others have argued, one needs knowledge based on the naturalist world to achieve such an aim.

Garrett describes how Tibetan medical history demonstrates that the boundaries between medicine and religion were intentionally and rhetorically complicated where medical knowledge was transmitted often through kinship lineages and distinct traditions formed through these lines of transmission (Garrett 2014:189). She shows how doctrines, texts, and individuals "crossed affiliations in a complex web of influences" and intertwined "Buddhist ethical ideals, theoretical structures, practical technologies and

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[533] ལྷག་བསམ།

[534] བྱང་ཆུབ་སེམས་དཔའ། *bodhicitta*

institutional power" (2014:189). Garrett describes how even in the *Blue Annals*, the well-known fifteenth-century text in the history of religion[535] genre by Go Lotsawa Zhonupal[536] (1392-1481), a student of Tsongkhapa, numerous individuals are referred to as healers[537], and many stories of illness and healing are described (2014:191). Here we see the integration of Buddhist ritual with medical knowledge and practice. She describes how the *Blue Annals* details the majority of references on the section describing the Nyingma lineages and early translations of tantras; the lineage of Marpa and early Kagyu teachers, the Pacification[538] tradition, and the Cutting Off[539] tradition. Very few from the second diffusion of Buddhism mention individuals with the title of doctor, and of the new transmission tantras, only those related to the story of Machig Labdron. Garrett also describes how the *Blue Annals* describe how illnesses are treated by many others than doctors: astrologers, those with strong compassion, religious doctrine, seclusion, meditation, proper prognostication of omens, and so forth (Garrett 2014:194). Likewise, various ritual prescriptions and practices extend much beyond the scope of the *Four Medical Transmissions*. If one seeks to provide the greatest benefit to suffering beings, one must study and practice widely. As Gen Jamyang stated, "One does not need Buddhism to be a good physician, but it will certainly help one achieve the greatest benefit for the greatest number" (Jamyang Gyatso 2017).

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[535] ཆོས་འབྱུང་།

[536] འགོས་ལོ་ཙཱ་བ་གཞོན་ནུ་དཔལ།

[537] Using the term སྨན་རྩི།

[538] ཞི་བྱེད།

[539] གཅོད།

This paradigm permeates the socio-cultural context in which Tibetan medicine is studied and practiced. It also frames assumptions of what is knowable and what one individual can know about another individual's body, mind and condition, including diagnostically for a physician and her patient. There is an additional layer to these practices in that the efficacy of the medicines and rituals in such practices are also to be conducted for the benefit of the physicians themselves (Garrett 2014:180).

It is here that we look into a window of an entire canon of Buddhist texts and practices that have played an important role for Tibetan medical and Buddhist scholars and practitioners. Frances Garrett (2009) describes those related to the *mendrub* practice as situated distinctly within the Nyingma canon's *Eight Means of Accomplishment*[540] (214), primarily within the Mahāyoga scriptural division of the Nyingma School's distinctive nine vehicle[541] Buddhist path doxography. As Garrett notes, "[I]n the eyes of Nyingma doxographers, Accomplishing Medicine is generally seen to be a *Mahāyoga sādhana* cycle focused on a personal meditation deity, aimed ultimately at liberation from *saṃsāra*" (2009:215). Here we see the merging of personal practice, cultivating skills and qualities, generating expertise and achieving the means to enact healing. Garrett particularly notes the *Nectar Qualities Immortality* tantras collection includes as its last tantra, the collection's main locus of practical writings on healing illness *Nectar which*

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[540] སྒྲུབ་པ་བཀའ་བརྒྱད།

[541] Śrāvakayāna, Pratyekabuddhayāna, Bodhisattvayāna, Kriyatantra, Upatantra, Yogatantra, Mahāyoga, Anuyoga, and Atiyoga

Possesses the Light of Wisdom[542]. The *Jewel's Lamp which Clarifies the Signs of the Path* provides explanations on the signs of successful achievement of the Yuthok Nyingthik practice, describing that a greater capacity to diagnose illness is one of the signs that a practitioner has gained accomplishment by doing the practice (Nida Chenagtsang 2014:43).

Chapter conclusion

"Methods of diagnosis" as "methods of becoming" is the practice of engaging one's body, senses and mind in specific practices such that the doctor enters a transmogrification into an incisive embodied diagnostic tool. Such a process requires a series of pedagogical steps from conceptual deepening through memorization, recitation and familiarization with the text, its stanzas and its metaphors to perceptual sharpening in all sensory modes. It requires focused attention to sustain the practice of memorization and recitation and to allow the layers of simulation and visualization to unfold. It requires curiosity into the natural world to pay attention to cycles and patterns in one's self, one's patients, the weather, seasons, ecology, social relations and so forth such that the conceptual frameworks integrate with the visualized and the observed world. Furthermore it requires years of repetition and patterning of thousands of patients, thousands of cases, nuancing the conceptual layering found in the text with which one continues to deepen in one's relationship with clinical experience. And finally, it requires a dedication to the techniques of Buddhist practice—whether they be the Medicine

[542] བདུད་རྩིཡེ་ཤེས་འོད་ཕྲན་གྱི་རྒྱུད།

Buddha, Yuthok Nyingthik or one's personal *yidam*—in which one's capacities to know the body of another are assumed to be limitless, one's compassion for another is systematically developed in order to attend to the nuances of suffering and imbalance with greater accuracy and precision, and the senses are so finely tuned as to provide deep perspicacity to see both diagnostically relevant data and allow such insight to direct appropriate treatment. Thus, expertise is a lifetime process of integrated pedagogies of conceptual-perceptual dialectics, a conceptual-perceptual kindling, that uses the text as key informant, master teacher, and allow for the layers of experience, insight and perceptual attention to detail cultivate physician as embodied diagnostic tool.

Conclusion

When I entered Men-Tsee-Khang, I thought memorization would simply be part of the education that I needed to endure; I did not expect it to provide much practical benefit let alone shape my entire perspective on Tibetan medical education and re-frame my doctoral research focus. I was surprised by the processes I observed during memorization periods, the delight I experienced in reciting the text, its centrality even in efficiently reviewing content for exam, and its skillfulness in directing my clinical experience. It fundamentally changed my understanding of the processes we undertake to learn, train, and become Tibetan doctors. I observed how the text lived through quotations in our classrooms, recitations in our school hallways, in the recesses of the dorm rooms, in every clinical encounter with patients, and in casual conversations among senior physicians. The text and its oral, aural, and embodied presence permeated our lives, enacting its medicine, and fundamentally changed the way we perceive the world.

In learning animal tracking, I was familiar with the processes of sensory training —of patterning sensory capacities of one's body to detect change: shifts in wind direction, ambient pressure changes, humidity content in the air, temperature transitions and gradients, incident light angles, ambient moisture of surrounding plants, re-saturated regions of the ground, and so forth. I learned to attend to the visual cues of line, shape, texture, color, and value in a track, illuminating the age, identity, behaviors, and mind-sets of the being that made it. In my wilderness training, attuning the senses was central. In making fire by friction such as with a bow drill, I learned to pay attention to the heat near my foot arch, holding the fire board down adjacent to the erect twirling spindle that

filled the notch with heat and wood dust to become the coal. On a rainy evening, as my body hovered over the fire set and my arm bowed back-and-forth rigorously twirling the string-enwrapped spindle, the warm sensation near my foot was the only way I could tell the coal had coalesced and I could stop the bowed strokes to wrap the coal in tinder and blow it into flames. Similarly, on a dark moonless night, as my palms and finger pads moved back-and-forth to turn the hand drill stalk upright in its indented thin board socket, the unmistakable smell of the coalescing first embers told me I could finally rest my blistering hands to whisper fire from the coal. The rich language of birds, from the dawn symphony to the cascading series of alarms of a fox moving through the mossy swamp, trained my ears to pay attention to the rich aural landscape, the significance of each sound as well as the meaning of each absence. Testing the taste of the first leaves of pine needle growth in the spring and its thick lemon citrus flavor, I learned to cleanse my lungs and boost my budding spring energy reserves by attuning my tongue to this taste, deciphering similar characteristics in other edible plants.

This was a sensory environment in which I immersed for several years before I began my Tibetan medical training. It reminded me that this was a learning context that we *all* knew and developed during human history. It comprised our developmental ecology as a human species for millennia before the current structured urban environments became our home and sensory training grounds. Input sensory data is critical to the proper development of our senses. Without this input, as with antigens training the capacities and expectations of our immune system, the senses cannot properly develop what types of neurons and neural pathways they need without the

material engagement. It directs what environments the senses can expect, what capacities it needs to perform, and what structures are needed to fulfill those functions—training by experience.

Similarly, my education in Tibetan medicine demonstrated that the learning environment matters. The environment itself does much of the imprinting: the natural cycles one must track, the specific understandings of the body and relationships to health and illness one must engage, the internal and external conditions that affect such pathways and pathophysiologies that one must manipulate to re-establish or maintain health.

Tracking, however, is a field of embodied knowledge in which no textbook exists. There is nothing to memorize or recite. In the last few decades, some of the great trackers in North America have written texts and guides for learning tracking[543]. Many of them are excellent. However, even after rigorous study of all published guides, they only scratch the surface of that which one needs to learn about tracking to become a proficient tracker. Likewise, tracking is a field of embodied knowledge based on experience, exposure and repetitions—*exposure* to the breadth and depth of tracking cases, *experience* of the infinite variety and diversity of conditions in tracking a single species, let alone an individual of that species, and *repetitions* in patterning commonalities and differences across various types of ground cover, animals, individual idiosyncracies,

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[543] See for instance, Olaus Murie's *A Field Guide to Animal Tracks* (1954); James Halfpenny's *A Field Guide to Mammal Tracking in North America* (1986); Tom Brown's *Field Guide to Nature Observation and Tracking* (1986); Charles Worsham's *Techniques of Tracking on Various Ground Covers* (1989); Paul Rezendes' *Tracking and the Art of Seeing* (1999); Mark Elbroch's *Mammal Tracks & Sign: A Guide to North American Species* (2003); Jon Young's *Animal Tracking Basics* (2007); and co-written with Elbroch, Louie Liebenberg's *Practical Tracking* (2010).

weather conditions, gaits, and so forth. In many ways, everyone writes their own textbook, through field notes and embodied memories, with the assistance of a patient and perceptive teacher. Thus, in tracking, as in medicine, the relationship with the teacher is critical. The textbook is written through the relationship of teacher and student.

One of the greatest tracking teachers in the West, Charles Worsham, also a renowned super-realist artist, is known in the tracking community for having sent a large trunk filled with over two thousand pages of his exquisitely detailed and illustrated tracking journals of all the tracking cases he documented over the decades to the garbage dump. "You will never grow and learn by studying my journals," he said, "They will become a curse for you. You have to write your own."

"Those cases are meaningless to others," Charles said recounting the story, "Each of those pages are like skeleton sketches of the experience. What the actual tracks looked like, felt like, and smelled like are in my memory. What I got down on paper is just a trigger to remind myself of the actual track and experience." The words and sketches evoke embodied memories. They become part of you, he described.

Before retiring from teaching tracking to focus on his art, Charles had increasingly simplified his mode of teaching tracking —based on years of his work with Cherokee elders, studying the Cherokee language, and their ways of tracking[544]. Instead of extensively introducing foot morphologies and gait types and declinations like he used to, he began teaching simplified shapes of feet and four classic gaits—walk, trot, run, and jump—as described in the Cherokee approach to teaching tracking. He combined these

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[544] Charles is also part Cherokee.

simplified shapes and gaits with the five elements of visual perception—line, shape, color, texture, and value—letting students assemble the rich details of what they observed in the field from there. Learning tracking from Charles also meant learning its aesthetics and poetics.

Although a condensed tracking canon has not emerged in written form for and from tracking, it likely does exist as oral tradition among many of the great tracking cultures[545], as Charles found out from the Cherokee. This form of teaching tracking that focuses on the poetics of simplified visual cues and the aesthetics of identifying and interpreting form based on these perceptual directives reminds me of what I experienced in the aesthetics and poetics of memorizing, reciting, and experiencing the *Four Medical Transmissions*.

The *Four Medical Transmissions* condense the conceptual knowledge into pithy theoretical forms and exemplary case types. It directs the physician to pay attention to perceptual cues: rough versus smooth, light versus heavy, sharp versus dull, cool versus warm, stable versus mobile, dense versus non-dense, thick versus thin, flexible versus rigid, dry versus moist, hard versus soft. These cues, written into the definitional characteristics of the five elements and the three *nyépa—rlung*, *tripa* and *béken*—relate to functional pathways and dysfunctional pathophysiologies, as well as seasons,

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[545] These include the !Xo San and !Kung San in the central Kalahari and related groups, various Australian Aborigine tribes of central Australia, the Lipan Apache of northern Mexico, and, in a related form, the northern hunting tribes of the circumpolar regions. There are many other communities around the world that draw upon environmental perceptual tracking tools and technologies; however, the great tracking cultures developed because they exist in environments where the ground is impressionable and retains the form and integrity of a given track with high spatial and temporal resolution. This allows for a greater clarity, and curiosity on the community's part, in understanding and perceiving the behavioral dynamics illustrated in tracks, and developing tracking knowledge to more nuanced understandings of identifying and aging impressions and marks of many kinds.

medicinal plants and substances, behaviors and mindsets, therapies and procedures. They train one to see more, feel more, taste more, experience more, as the same qualities are tracked through material relationships. Just like the five principles of visual perception, one learns perceptual guidelines that direct the perceived data that one attends to through the process of *apoha*—carving out meaningful perceptual forms—and provide a basis from which to make inferences based on these perceptions. These cues comprise the characteristics elicited in the traditional biomarkers of perceptual references to which Tibetan medical diagnostics attend. They mediate causal conditions, their interactive processes, and their ultimate outcomes.

This process is similar to how biomarkers characterize embodiment processes in developmental paradigms as seen in the bioecocultural model. The influences of beliefs, values, meanings, behaviors, practices and material settings on the biology of each individual allow us to see how physiologic processes are altered by human ecology. We can track the aspects of these dynamic structures, influences, and distal and proximal processes through biomarkers. Phenotypic variation, experiential worlds, behavioral variation, and, ultimately, habitus demonstrate how these modes of embodiment translate from developmental programming into differential health outcomes over the life course.

In this work, I look at the pedagogical processes of how memorizing and reciting the *Tibetan Medical Transmissions* allow Tibetan medical students to gradually familiarize the perceptual cues, metaphorical instructions, and analogous thinking to re-shape the way one perceives and layers clinical experience into these conceptual directives. I look at how cognitive neuroscience provides a rich framework to understand

these processes on a biological level where metaphor and perceptual-conceptual dialectical engagement blur distinctions between semantic and episodic memory, as well as forms of explicit and implicit memory. These enacted performative cognitions are, likewise, employed as diagnostic instrument à la Dharmakīrti's *pramāṇa* theory. For the purpose of alleviating suffering, both physical and mental, the physician actively trains in practices that cultivate skills in compassion: gaining greater insight into causal relationships between emotional and physical imbalance, distress, pain, discomfort, despair, dissatisfaction and discontent. As Dharmkīrti's work on *apoha* and *pramāṇa* shows, a high fidelity relationship between perceptions and inferences can provide a learning approach that trains recognition and tracking of perceptual cues that will provide a basis for conceptual frameworks about the processes that drive health and disease, ultimately aimed at providing treatment and various other interventions to relieve the suffering.

Tibetan medical pedagogy based on memorization and recitation is aimed at more than imparting a knowledge corpus to the learner, but training and transforming the participant by engaging with the text as master teacher, one's mentor as guide, one's classmates as support, and an openness to the means of transformation. Ultimately methods of becoming are methods of diagnosis when the body itself becomes both the instrument and the teleological basis of achieving this greater purpose: compassionate means of relieving suffering.

Diagnosis without embodiment

One might ask, when is embodied knowledge not used in diagnosis, and what stages in a physician's training and professional trajectory minimize its use? In applying the conceptual-perceptual dialectic to understanding all processes in embodied knowledge cultivation, we can observe a general trajectory in developing expertise in which knowledge moves from conceptual to perceptual felt bases. In Western medicine as well, surgeons and physicians who have practiced for decades describe experiences of instantly "knowing" the diagnosis of a new patient by a mere glance, how the patient speaks, or by the sound of a distinct walk as the patient enters the office. These physicians have developed a "diagnostic sense" from the volumes of patient cases and interactions to which they have been exposed. In the same way, Western medical students are gaining conceptual bases from which to build their experiential repertoire just as Tibetan medical students are patterning their mind and senses to track disease through the modalities Tibetan medicine uses. The difference is a sociocultural assumption of what qualifies as valid knowledge and the criteria by which evidence is assessed. Yet many Western physicians acknowledge that it is their perceptual sense vis-à-vis their patient relationship that guides their diagnostic assessments and therapeutic approaches, beyond the scope of any external means of diagnostic testing. Even medical schools are integrating curriculum around the role of "intuition" in diagnostics to facilitate such skills and resources. The term "intuition" can unnecessarily obfuscate a natural process of sensory-perceptual training in which we are all skilled and upon which reliable information can be obtained. Intellectual traditions that acknowledge such means of

knowing, such as in Tibetan medicine, readily delineate details of technique, training, and reliability of result, and can provide a powerful window for us to understand these human technologies of our own bodies.

Processes in cultivating embodiment for diagnostic application

This work contributes to the anthropology of the great orally transmitted literate cultural traditions, specifically focused on body and medical knowledge. It has contributed data toward understanding the role of combining an oral tradition with a literary tradition in order to maintain transmission integrity for a sophisticated knowledge corpus to a large group of specialists, especially when outcomes can mean life or death for those whom the knowledge is meant to benefit: the patients. In particular, this work illustrates the role of textual engagement in developing technical embodied knowledge for medical purposes and the alleviation of suffering broadly. It shows how textual use of metaphor and visualization patterned through memorization, recitation, and engagement with practical experience trains the sense over time to recognize nuanced sensory information for diagnostic purpose. It demonstrates the mechanics of Dharmakīrti's theory of perception and valid cognition showing the conceptual-perceptual dialectic undergirding embodiment processes. This is substantiated by findings in cognitive neuroscience regarding the mechanism by which metaphor blurs distinctions between semantic and episodic memory and plays a role in moving from explicit to implicit forms of memory, and ultimately integrating the two.

As Mauss contends, the body is the instrument of achieving one's aims. And as Bourdieu asserts: the body believes in what it plays at. Through metaphor, the text prompts the physician to inculcate a specific habitus, engaging new ways of seeing with diagnostic insight, new ways of feeling through sensitized diagnostic touch. The body "does not represent what it performs, it does not memorize the past, it enacts the past, bringing it back to life. What is 'learned by body' is not something that one has, like knowledge that can be brandished, but something that one is" (Bourdieu 1992:73). The physician engages a patterning of the senses in the act of memorization and recitation, and invokes that "learned body" in the clinic with the patient in real time. The Tibetan medical approach to understanding the embodiment of disease processes applies Geertz's cultural inscriptions to a biological paradigm: mind, emotion, behavior, social relations, and ecology entextualized on the body, shaping biology, and allowing specific biologies to affect the possible affordances of cultural manifestations. The physician trains in reading these bodies as living, breathing texts, perceptual cues as messengers of the histories the body has experienced and lived through, and the new histories it is creating.

Reflections

Tibetan medical pedagogy exemplifies a literate oral tradition implementing a specific epistemology of embodied knowledge deployed for tracking pathways of health and illness through perceptual means. This work has drawn upon biocultural methods to understand embodiment processes using two analytic dimensions, namely, physician as embodied diagnostic instrument and patient as embodying disease processes. This work

has probed the modes of embodiment as intentional means in systematically training expertise, and as receptive means in tracking the social, cultural, and biological influences of a rich disease ecology from development through the life course.

The pedagogical approach both at Men-Tsee-Khang and Sorig Loling drew upon an intellectual history that characterizes Tibetan scholasticism in terms of training in the five Tibetan fields of knowledge, which provide a specific ontology and epistemology from which Tibetan medicine is framed and approached. Tibetan medicine's epistemic paradigm for education employs memorization and recitation as a foundation upon which conceptual and experiential understanding of medically relevant content and naturalist knowledge writ large is layered. In this interrelational layering process, stratum of embodied memory integrate metaphorical and visualized content of the text alongside experiential knowledge from the clinic and natural world. These experiences inculcate a specific embodied knowledge, rigorously implementing a pedagogy that draws upon our understandings of enacted cognition into an educational context. Acknowledging the situatedness of our learning environments, and the contextual production of disease and health, the pedagogy formulates techniques in learning that track modes of being in disease and health using perceptual training to track biomarkers identified as indicators mediating these processes.

From a Mauss approach to habitus, the medical training builds an understanding of one's body as the "first and most natural tool" (Mauss 1973b:56) in achieving one's goals; and it frames the goal as tracking the relational pathways of disease and health so as to relieve suffering and distress. The body, mind, and senses are forged in such a way

that they continually attune, integrating their embodied instrumentation toward the achievement of tracking disease pathways. From the Bourdieusian perspective, that which is 'learned by the body' becomes enacted, not as knowledge to be deployed, but as knowledge and methods of its procurement such that the knowledge gradually becomes 'something that one is' (Bourdieu 1992:73). The sensitivities and proclivities that the work of metaphor, visualization, and familiarization provide through the means of memorization and recitation of the text, inculcate specific 'affordances' of socio-cultural-ecological processes that direct perceptual tracking for drawing reliable inferences.

Cognitive neuroscience perspectives and Dharmakīrti's approach to perception and the instruments of knowledge provide lenses to understand these pedagogical processes whereby specific learning techniques—memorization and recitation; metaphor and visualization; debate and logic; clinical, pharmacological and ecological experience—integrate content on anatomy and physiology, developmental ecology, pathology, social and cultural relations, psychology, and the means by which these various influences direct disease processes and the life course of health and illness. Just as the bioecocultural model of child development (Worthman 2010) has demonstrated this vast network of influences on developmental trajectories and health outcomes, the understanding of developmental and disease ecology in Tibetan medicine facilitates a pedagogical approach that inculcates such understandings of disease pathways through embodied modes of learning.

In challenging the common assumptions about "rote memorization" and pedagogical values in Western education, this work suggests that memorization,

recitation, metaphor, and praxis learning generate a conceptual-perceptual dialectic that drives processes cultivating embodied knowledge transmission. For the Tibetan physician, "methods of becoming" are "methods of diagnosis" by developing the senses, training the mind, and sculpting the physician's skilled body as vessel and instrument for diagnosis and healing. Rigorous practice and associated self cultivation form the grounds for expertise acquisition through an organizing teleology. This project demonstrates a distinctive approach to medical education that simultaneously fosters rigorous medical knowledge and humanistic skills with distinctive diagnostic and therapeutic value.

Potential contributions

This work contributes scholarship to several disciplines and fields: anthropology, cognitive neuroscience, Dharmakīrti and *pramāṇa* scholars, and Tibetan medical practitioners. For anthropology, it contributes a particular framework for understanding the development of and training in embodied knowledge in anthropology, both generally as well as specifically, for specialist knowledge of health and disease. This work builds the case that oral transmission practices of literate traditions can provide a resilient model of cultural transmission regarding knowledge of and for the body. Such inquiry needs further development across other cultures and geographies to understand how these cultural transmission processes have functioned in human history. Tibetan medical diagnostic learning employs processes of a conceptual-perceptual dialectic framed by Dharmakīrti's work on *apoha* and *pramāṇa* for the specific purpose of alleviation of physical and mental suffering in a conventional world through medical means. As such,

this work provides a specific application of Dharmakīrti's *pramāṇa* theory as it applies to the training of embodied knowledge for Tibetan physicians. I suggest that we take serious the implications of the conceptual-perceptual dialectic that stems from Dharmakīrti's theories and its applications in other realms, not just in yogic perceptions. Because the epistemic and ontologic influences of *pramāṇa* theory has shaped the development of many other scholastic disciplines, including other medical traditions in the Indic, Tibetan, and Chinese contexts, such applications could provide instructive insights.

I also suggest that we direct research in cognitive neuroscience to investigate the interplay of metaphor, visualization, and the processes of conceptualization and perception to problematize how we understand modes of memory and enactment in lived context. Because Tibetan medical diagnostic training suggests that implicit and explicit forms of memory, as well as semantic and episodic, are blurred through the embodied use of metaphor, visualization, memorization, and recitation, and enacted clinical contexts, research paradigms that probe such lived applications could provide productive realizations of how embodied cognition functions. Sensory perception cannot faithfully record the external world. Instead, it is a selective, constructive process that uses narrowly focused receptor-detectors and specific rules in the brain's afferent pathways to gather and put together the incoming information as Dharmakīrti has shown in *apoha* theory. As such, we should also focus inquiry in cognitive neuroscience studies toward the understanding of perceptual-inferential processes and our assumptions of such types of cognition.

Finally, as a message to my fellow classmates and all future Tibetan medical physicians, there has been pressure to begin eliminating memorization and recitation practices and requirements from our curriculum in contemporary Tibetan medical education. I hope this work contributes to the confidence and affirmation that these are novel and critical technologies for our medical practice in deriving embodied knowledge for not only excellence in diagnostic skill but therapeutic benefit and personal self-development. May such skills continue to be cultivated and honed by Tibetan physicians for many generations to come.

Appendices

Appendix 1
Four Medical Transmissions Contents & Structure

	Root Transmission	Explanatory Transmission	Oral Instructions Transmission		Subsequent Transmission	Total
Total # pages	16 pp	100 pp	525 pp		140 pp	781 pp
Total # chapters	6 chapters	31 chapters	92 chapters		25+2 chapters	156 chapters
Total # sections	N/A	11 Sections (*gnas bcu gcig*)	15 Categories (*skabs bco lnga*) **Note: each chapter presents etiology, types, diagnostics and treatment for each disorder		4 Compendia (*mdo bzhi*)	8 Branches 11 Sections 15 Categories 4 Compendia 2 Concluding Chapters
	1 chapter (1) *Tanaduk* City of Medicine	1 chapter (1) Basic Summary	1 chapter (1) Requesting the Teachings		2 chapters (1-2) Examination of Pulse and Urine	
	1 chapter (2) Enumeration of Chapters and Content	6 chapters (2-7) Formation of the Body, Anatomy & Physiology	4 chapters (2-5) Three *Nyépa* and Compounded Disorders	BRANCH 1 Diseases of the Body	10 chapters (3-12) Pacifying Medications (decoctions, powders, pills, pastes, butters, ashes, concentrated syrups, alcohols, precious medicines, herbal medicines)	
	1 chapter (3) Health and Disease Theory	5 chapters (8-12) Pathology	6 chapters (6-11) Internal Disorders		7 chapters (13-19) Cleansing Medications & Therapies (oil application, laxatives, emetics, nasal medicine, enemas, douches)	

	Root Transmission	Explanatory Transmission	Oral Instructions Transmission		Subsequent Transmission	Total
	1 chapter (4) Diagnosis	3 chapters (13-15) Behavior	16 chapters (12-22) Hot Disorders & (23-27) Contagious Disorders		7 chapters (20-25) External Therapies (venesection, moxabustion, compresses, medicinal baths, massage, minor surgery)	
	1 chapter (5) Treatment	3 chapters (16-18) Diet	6 chapters (28-33) Upper Body Disorders		1 chapter (26) Concluding Chapters	
	1 chapter (6) Allegorical Summary	3 chapters (19-21) Pharmacology	8 chapters (34-41) Disorders of Vital & Vessel Organs		1 chapter (27) Entrusting the Teachings to the Student	
		1 chapter (22) Surgical Instruments	2 chapters (42-43) Disorders of the Genitals			
		1 chapter (23) Health Maintenance	19 chapters (44-62) Miscellaneous Disorders (asthma, dysphagia, polydipsia, vomiting, diarrheal conditions, dysentery, constipation, arthritis, gout, diabetes, nervous disorders, skin disorders, etc.)			
		3 chapters (24-26) Diagnostic Theory	8 chapters (63-70) Coemergent Wounds (cancer, hemorrhoids, ulcers, lymph disorders, vein disorders, perineal fistulas)			
		4 chapters (27-30) Treatment Approaches	3 chapters (71-73) Infant Care & Pediatric Disorders	BRANCH 2		
		1 chapter (31) Qualities of the Physician	3 chapters (74-76) Women's Disorders	BRANCH 3		
			5 chapters (77-81) Spirit Disorders (epilepsy, dementia, schizophrenia, possession, mental disorders, skin conditions, etc)	BRANCH 4		

	Root Transmission	Explanatory Transmission	Oral Instructions Transmission		Subsequent Transmission	Total
			5 chapters (82-86) Traumatology (wound care, bone-setting)	BRANCH 5		
			3 chapters (87-89) Poisoning and Disorders due to Toxins	BRANCH 6		
			1 chapter (90) Geriatric Treatments, Rejuvenation Therapies & Elixirs	BRANCH 7		
			2 chapters (91-92) Restoring Virility and Infertility Treatment	BRANCH 8		

Appendix 2
Relevant chapters from the *Four Medical Transmissions*

The chapters most pertinent to this work, and from which I draw my analysis, include:

- *Root Transmission*: entire text, but specifically, Chapter 3 "Physiology" and Chapter 4 "Diagnosis;"
- *Explanatory Transmission*: entire text, but specifically—
    - Chapter 4 and 5 on anatomy and physiology
    - Chapter 8 thru 12 on causes, conditions, modes of entrance, characteristics, classification of disorder
    - Chapter 24 thru 26 on diagnostic theory specifics
    - Chapter 31 on the learning processes and cultivated qualities of the Tibetan physician
- *Oral Instructions Transmission*:
    - This volume details the pathology, diagnosis and treatment of each condition recognized in Tibetan medicine through 92 chapters. In this work I highlight content from the five chapters for the disorders of the functional energy systems (*rlung*, *tripa*, *béken, düpa*) as well as the chapters on internal illnesses, improper metabolism and digestive processes (*mazhuwa*), which are integral to the formation of most internal illnesses and specifically to *dré-né* and *tren*, *tren*, hot illnesses, specific organ conditions, and spontaneous lesions, which includes *dré-né*.
- *Subsequent Transmission*: Chapter 1 and 2 on specifics of pulse and urine diagnosis

Appendix 3
Historical Figures, Dates & Works related to Tibetan Medical Education

***Note: figures in black are directly connected to Tibetan medical education through their works or practices, those in grey are provided as context of Buddhist scholar contemporaries*

Sixth to fourth century BCE
Siddārtha Gautama
Jīvaka Komārabhacca (physician to Gautama Buddha)

First century CE
Buddhadeva (ca. 1st century CE): Vaibhāṣhika Dharmatrāta (ca. 1st century CE): Vaibhāṣhika Vasumitra (ca. 1st century CE): Vaibhāṣhika Ghoṣhaka (ca. 1st century CE): 132 Vaibhāṣhika Avitarka (ca. 1st century CE): Chittamātra

Second century
Nāgārjuna (second century): model Prāsaṅgika
- *Fundamental Treatise on the Middle Way*

Āryadeva (second to third century): model Prāsaṅgika
Āchārya Shūra (or Ashvaghoṣha) (second to third century)

Third century
Shrīlāta (330–410): Sautrāntika

Fourth century to Fifth century
Asaṅga (late fourth to early fifth century)
Vasubandhu (late fourth to early fifth century)
- *Abhidharmakośakārikā* (*Verses on the Treasury of the Abhidharma*)

Saṅghabhadra (late fourth to early fifth century): Vaibhāṣhika
Dignāga (late fifth to mid sixth century)

Sixth century
Saṅgharakṣhita (early sixth century): Sautrāntika Buddhapālita (early sixth century)
Vimuktisena (early sixth century)
Sthiramati (ca. 470–550)
Bhāvaviveka (ca. 500–570): Sautrāntika-Svātantrika-Madhyamaka
Dharmapāla (ca. 530–561)

Seventh century
Dharmakīrti (ca. late sixth to early seventh century)
- *Commentary on Valid Cognition*

Chandrakīrti (sixth to seventh century): Prāsaṅgika-Madhyamaka
Shrīgupta (seventh century): Svātantrika-Madhyamaka

Eighth century

Padmasambhava (eighth century)
Shāntideva (early eighth century)
Jñānagarbha (700-760): Svātantrika-Madhyamaka
Āryadeva II
Shāntarakṣhita (725-783): Yogāchāra-Svātantrika-Madhyamaka
Kamalashīla (740–795): Yogāchāra-Svātantrika-Madhyamaka
Haribhadra (late eighth century): Svātantrika-Madhyamaka

Ninth to twelfth century
Yeshé Dé (early ninth century)
Kawa Paltsek Lotsāwa (early ninth century)
Thagana (ca. ninth century): Svātantrika-Madhyamaka
Jetāri (ca. eleventh century)
Bodhibhadra (ca. 1000)
Ratnākarashānti (early eleventh century)
Atīsha (982–1054): Svātantrika-Madhyamaka
Chandrakīrti the lesser (eleventh century)
Lakṣhmīkara (eleventh century)
Maitrīpa (1012–1097)
Sahajavajra (eleventh to twelfth century)
Rongzom Paṇḍita Chökyi Zangpo (eleventh century) (Nyingma)
Zu Gawé Dorjé (eleventh century): Shentong-Madhyamaka
Tsen Kawoché (b. 1021): Shentong-Madhyamaka
Yumo Mikyö Dorjé (b. 1027): Shentong-Madhyamaka
Milarepa (1040–1123)
Jayānanda (second half of the eleventh century)
Ngok Lotsāwa Loden Sherab (1059–1109)
Pa-tsap Lotsāwa Nyima Drak (b. 1055)
Gampopa (1079-1153) “the physician from Dakpo”
• *Jewel Ornament of Liberation*
Abhayākaragupta (late eleventh to early twelfth century)
Mokṣhākaragupta (ca. eleventh to twelfth century)
Chapa Chökyi Seng-gé (1109–1169)
Yuthok Yonten Gonpo the Younger (1126-1202) (Nyingma)
• *Four Medical Transmissions (Gyushi)*
• *The Embellishment of Realization (Gong Gyen)*
Sakya Paṇḍita (1182-1251) (Sakya)
• Treasury of Logic on Valid Cognition (ཚད་མ་རིགས་པའི་གཏེར།)
• Discrimination of the Three Vows (སྡོམ་གསུམ་རབ་དབྱེ།)
• The Entrance Gate for the Wise (མཁས་པ་རྣམས་འཇུག་པའི་སྒོ།)
• Clarifying the Sage’s Intention (ཐུབ་པའི་དགོངས་གསལ།)
• The Elegant Sayings of Sakya Pandita (ས་སྐྱ་ལེགས་བཤད།)

Thirteenth to Sixteenth centuries

Buddhajñānapāda (ca. thirteenth century): Svātantrika-Madhyamaka
Third Karmapa, Rangjung Dorjé (1284–1339): Shentong-Madhyamaka (Kagyu)
Dolpopa (1292–1361): Shentong-Madhyamaka (Jonang)
Longchen Rabjam (1308–1364): Shentong-Madhyamaka (Nyingma)
Rongtön Sherab Gyaltsen (1367–1449) (Sakya)
Tsongkhapa (1357–1419) (Geluk)
Tak-tsang Lotsāwa (b. 1405) (Sakya)
Kyempa Tsewang (15th century)
- *Kyemdrel. Explanatory Principles on the Gyushi.*

Gorampa Sonam Seng-gé (1429–1489) (Sakya)
Shākya Chokden (1428–1509): Shentong-Madhyamaka (Sakya) Seventh Karmapa, Chödrak Gyatso (1454–1506) (Kagyu)
Karma Tinlé Choklé Namgyal (1456–1539) (Kagyu)
Eighth Karmapa, Mikyö Dorjé (1507–1554) (Kagyu)
Zurkharwa Lodro Gyalpo (1509-1579)
- *Oral Instructions of the Ancestors (Mépé Zhalung)*

Tāranātha (1575–1634): Shentong-Madhyamaka (Jonang)

<u>Seventeenth to Eighteenth centuries</u>

Fifth Dalai Lama (1617-1682) (Geluk, but lineage of Pema Lingpa)
Jamyang Shepa (1648–1721) (Geluk)
Desi Sangye Gyatso (1653-1705) (Geluk, but lineage of Pema Lingpa)
- *Blue Beryl* (*Bé-ngön*)
- *White Beryl* (*Bé-kar*)
- *Oral Instructions Supplement* (*Men-ngak Lhentap*)

Deumar Tenzin Phuntsok (1673-1743)
- *Crystal Rosary* (*Shelgong Sheltreng*)

Kaḥ-tok Rikdzin Tsewang Norbu (1698–1755) (Nyingma: Shentong-Madhyamaka)
Situ Paṇchen Chökyi Jungné (1699–1774) (Kagyu: Shentong-Madhyamaka)
Chang-kya Rolpé Dorjé (1717–1786) (Geluk)
Könchok Jigmé Wangpo (1728–1791) (Geluk)
Losang Könchok (1742–1822) (Geluk)
Getsé Paṇḍita Gyurmé Tsewang Chokdrup (1761–1829) (Nyingma)

<u>Nineteenth century on</u>

Dza Paltrul (1808–1887) (Rimé-Nyingma)
- *Words of My Perfect Teacher*

Jamgön Kongtrul Lodrö Tayé (1813–1900) (Rimé-Kagyu-Nyingma)
- *Medical Notes [on Formulas] (Zintik Yangtik)*
- *The Treasury of Knowledge*

Jamyang Khyentsé Wangpo (1820-1892) (Rimé-Nyingma-Sakya)
Chokgyur Lingpa (1829-1870) (Rimé-Nyingma)
Ju Mipham (1846–1912) (Rimé-Nyingma)

- *Gateway to Knowledge*

Khenrab Norbu Rinpoche (1882-1962) (Geluk)
- *Explanatory Allegorical Trees* [*of Health and Disease*]
- *Medicinal Benefits*
- *(many texts)*

Troru Tsenam Rinpoche (1928 – 2004) (Rimé-Nyingma-Kagyu)
- *Oral Instructions of the Sages* (*Drangsong Zhelung*)

Samten (late 20th century)
- *New Dawn Compendium of Medicine* (*Kyareng Sarpa*)

Appendix 4
Daily and Annual Schedules: Men-Tsee-Khang and Sorig Loling

Daily Schedule at Men-Tsee-Khang

The tables below show daily and annual schedules for Men-Tsee-Khang. The daily schedule demonstrates how time is allocated for each pedagogical modality, as with the curricular progression generally.

	May* 2011 through August 2013	
	Mon - Fri	Saturdays & Sundays
5:30am - 6am	Personal time: e.g., Buddhist practice & meditation (individually)	SUNDAYS: OFF TIME Textual study and memorization (individually)
6am - 7am	Memorization & recitation (1.5 hr) - (new chapter material) (individually)	
7am - 7:30am	Chants, prayers, and mantra recitation (as student assembly)	
7:30am - 7:45am	Breakfast (school cafeteria)	
7:45am - 8:45am	Memorization & Class Prep (1 hr) - (new chapter material) (individually)	
9am - 1pm	Class	
1pm - 1:30pm	Lunch (school cafeteria)	
2pm - 4pm	Memorization and textual study; occasional c**linical apprenticeship (3 1/2 hrs)** with Dr. Lobsang (private lineage amchi) (individually)	
4pm - 5pm	Memorization and textual study (individually)	
5pm - 6pm	Yoga (individually)	
6pm - 6:45pm	Dinner and walk with classmates (school cafeteria and surrounds)	
7 - 7:30pm	Chants, prayers, and mantra recitation (as student assembly)	

	May* 2011 through August 2013	
	Mon - Fri	Saturdays & Sundays
7:30 - 8:30pm	Mon/Thurs: Debate (classic philosophical logic style on medical definitions and terms) (as class) Tues: Anatomy video tutorials (as class) Wed/Fri: Voice of America viewings (as student assembly)	
8:30pm - 10pm	Memorization & Recitation (1.5 hr) - (new chapter material) (individually)	

**Note: I arrived in May 2011 for the entrance exam. We entered classes right after the entrance exam for our preliminary year (till December 2011) and maintained a similar schedule thereafter entering the first year of our medical training formally in March 2012. I had to return to Emory for my final doctoral qualifying year September 2011 to April 2012, so I missed three months of the preliminary year and the first month of our first formal year of medical training. My late arrival in April 2012 was due to completing my comprehensive and qualifying exams at Emory for the doctoral program. For the time that I missed, my classmates recorded and emailed me course lectures so I could stay caught up while finishing up at Emory.*

May - July 2012	**August 2012**	**Sep - Dec 2012**	**Jan - Feb 2013**	**Mar - July 2013**
Men-Tsee-Khang	(School Field Expedition)	Men-Tsee-Khang	(School Break) 2 months	Men-Tsee-Khang
Classes - Class participant observation - Student & faculty informal interviews - Memorization & Recitation	**Plant Gathering Field Expedition (Manali)** - Participant-Observation - Informal student and faculty interviews	**Classes** - Class participant observation - Student & faculty informal interviews - Memorization & Recitation, familiarization with education pedagogy	**January Xining (China) Clinical Apprenticeship** - Diagnosis practicums - Student & faculty informal interviews - Clinical participant observation - Expert physician interviews **February visit Root teacher (Nepal)** - Buddhist practice	**Progress in curriculum and begin clinical participant-observations:** - Class participant observation - Student & faculty informal interviews - Diagnosis practica - Clinical participant observation - Expert physician interviews - Memorization & Recitation

Daily Schedule at Sorig Loling

The tables below show daily and annual schedules for Sorig Loling. The daily schedules are a sample for my first year, September 2013 through June 2014, along with my summer schedule (June through August 2014), which was similar to the winter schedule since both were heavy with internship time at the Tibetan medical hospital. August 2014 through July 2015 is similar to the previous year, with two months returned to Atlanta due to visa difficulties before returning to Xining for my final graduating exams and thesis presentation.

	FALL SEMESTER (SEP – DEC 2013)						
	MON	**TUES**	**WED**	**THURS**	**FRI**	**SAT**	**SUN**
5:30-6am	Meditation	Meditation	Meditation	Meditation	Meditation	Meditation	DAY OFF
6-6:30am	Prep for Day	Prep for Day	Prep for Day	Prep for Day	Prep for Day	Prep for Day	
6:30-8am	Memorization	Memorization	Memorization	Memorization	Memorization	Memorization	
8:15am – 9:45am	**CLASS** (Nyes gSum gSo-wa)	Tibetan Medical Hospital: Gastroenterology	**CLASS** (Upper Body Disorders)	Tibetan Medical Hospital: Internal Medicine (Outpatient)	Tibetan Medical Hospital: Gastroenterology	Tibetan Medical Hospital: Gastroenterology • Record copies • Treatment observations • Physician Discussions	
10:15am – noon	**CLASS** (Toxicology)	**CLASS** (Buddhist Logic & Theory, Sense Training)	**CLASS** (Hot Disorders/Infectious Disease)	**CLASS** (Nyes gSum gSo-wa)	**CLASS** (Infectious Disease)		
Noon – 2:15pm	LUNCH	LUNCH (w/ Amdo tutor classmates)	Physician Amdo tutor at Hospital, then LUNCH	LUNCH (w/ Amdo tutor classmates)	LUNCH	LUNCH (Data Processing)	
2:15 – 4pm	CLASS (Buddhist Logic) -OR- Chinese Tutor	CLASS (Miscellaneous Disorders)	Research Processing	CLASS (Miscellaneous Disorders)	CLASS (Hot Disorders)	AFTERNOONS OFF (Research Analysis, Study, Memorize, Relax, Yoga, See Friends)	
4:30-6pm	Yoga/Gym -OR- Research Processing	Yoga/Gym	Yoga	Yoga/Gym	Yoga/Gym		
6:30 – 9pm	Dinner & Memorize	Dinner & Memorize	Dinner & Memorize	Dinner & Memorize	Dinner & Memorize		
9-9:30pm	Meditation	Meditation	Meditation	Meditation	Meditation		

	WINTER BREAK (JAN & FEB 2014)						
	MON	**TUES**	**WED**	**THURS**	**FRI**	**SAT**	**SUN**
5:30-6am	Meditation	Meditation	Meditation	Meditation	Meditation	DAY OFF	DAY OFF
6-6:30am	Prep for Day	Prep for Day	Prep for Day	Prep for Day	Prep for Day		
6:30-8am	Memorization	Memorization	Memorization	Memorization	Memorization		
8:15am – noon	Tibetan Medical Hospital: Gastroenterology	Tibetan Medical Hospital: Gastroenterology	Tibetan Medical Hospital: Gastroenterology	Tibetan Medical Hospital: Internal Medicine (Outpatient)	Tibetan Medical Hospital: Gastroenterology		
Noon – 2:15pm	Yoga/Gym & LUNCH	Yoga/Gym & LUNCH	Yoga/Gym & LUNCH	Yoga/Gym & LUNCH	Afternoons OFF		
2:30 – 5pm	Research Processing	Research Processing)	Research Processing	Research Processing			
5-6:30pm	English Class for Gastroenterology Dept	English Class for Gastroenterology Dept	English Class for Gastroenterology Dept	English Class for Gastroenterology Dept			
6:30 – 9pm	Dinner & Relax	Dinner & Relax	Dinner & Relax	Dinner & Relax			
9-9:30pm	Meditation	Meditation	Meditation	Meditation			

	SPRING SEMESTER (MAR – JUN 2014)						
	MON	**TUES**	**WED**	**THURS**	**FRI**	**SAT**	**SUN**
5:30-6am	Meditation	Meditation	Meditation	Meditation	Meditation	Meditation	DAY OFF
6-6:30am	Prep for Day	Prep for Day	Prep for Day	Prep for Day	Prep for Day	Prep for Day	
6:30-8am	Memorization	Memorization	Memorization	Memorization	Memorization	Memorization	
8:15am – 9:45am	Tibetan Medical Hospital: Gastroenterology	**CLASS** (Traumatology)	Tibetan Medical Hospital: Gastroenterology	Tibetan Medical Hospital: Internal Medicine (Outpatient)	Tibetan Medical Hospital: Gastroenterology	Tibetan Medical Hospital: Gastroenterology • Record copies • Treatment observations • Physician Discussions	
10:15am – noon		**CLASS** (Pediatrics/Gynecology)	**CLASS** (Traumatology)	**CLASS** (Traumatology)	**CLASS** (Pediatrics/Gynecology)		
Noon – 2:15pm	LUNCH	LUNCH (w/ Amdo tutor classmates)	Physician Amdo tutor at Hospital, then LUNCH	LUNCH (w/ Amdo tutor classmates)	LUNCH	LUNCH (Data Processing)	
2:15 – 4pm	Research Processing	**CLASS** (Mental Disorders)	**CLASS** (Pediatrics/Gynecology/ Mental Disorders)	Research Processing	**CLASS** (Pediatrics/Gynecology/ Mental Disorders)	AFTERNOONS OFF (Research Analysis, Study, Memorize, Relax, Yoga, See Friends)	
4:30-6pm	Yoga/Gym	Yoga/Gym	Yoga	Yoga/Gym	Yoga/Gym		
6:30 – 9pm	Dinner & Memorize	Dinner & Memorize	Dinner & Memorize	Dinner & Memorize	Dinner & Memorize		
9-9:30pm	Meditation	Meditation	Meditation	Meditation	Meditation		

August 2013 - June 2014	**June - Aug 2014**	**Sep 2014 - Feb 2015**	**Mar - Apr 2015**	**May - July 2015**
Sorig Loling	(Hospital Internship & Field Expedition)	Sorig Loling	(Atlanta return due to visa issues) 2 months	Sorig Loling
Classes - Class participant observation - Student & faculty informal interviews - Memorization & Recitation - Gastroenterology Internship (4 days in-patient dept, 1 day out-patient dept)	**Gastroenterology Internship** - 4 days in-patient dept, 1 day out-patient dept **Plant Gathering Field Expedition** - Participant-Observation	**Classes** - Class participant observation - Student & faculty informal interviews - Memorization & Recitation - Internship rounds thru various departments	**Emory** - Listen to recorded classes sent by classmates - Prepare for Sorig Loling graduating exams and write graduating thesis	**Final Classes, Final Exams and Graduating Thesis Presentation & Submission** - Class & final exams and thesis presentation and submission participant observation

Appendix 5
Curricular Progression at Men-Tsee-Khang and Sorig Loling

Curricular Progression at Men-Tsee-Khang and Sorig Loling

The following is the six-year curricular progression for both Men-Tsee-Khang and Sorig Loling as well as my personal progression through the curriculum during the course of my education and transfer from Men-Tsee-Khang to Sorig Loling.

	TIDWELL TIMELINE	MTK SEMEST-ER	MTK CURRICULUM	SLL SEMEST-ER	SLL CURRICULUM	TT Intern-ship
Jan-May 2009	Began studies with Amchi Khenrab at his office at MTK					
Aug-Dec 2009	(At Emory) Skype classes with Amchi Khenrab (*Root Transmission, Explanatory Transmission)*; first year PhD program classes at Emory					
Jan-May 2010	(At Emory) Amchi Khenrab at Emory, assist his teaching *Explanatory Transmission*; first year Emory PhD classes					
June-Aug 2010	Tibet trip for Dragons (leader), meet Dzogchen amchi, meet Menpa Tsedra					
Aug 2010 - May 2011	MTK Entrance Exam prep "boot camp"; second year Emory PhD classes					
May 2011	MTK ENTRANCE EXAM	ENTRANCE EXAM				
	MTK May-Aug: preliminary year studies, began *Root Transmission* memorization	Preliminary Year *(Batch 17 was first batch to be required to attend a*	Tibetan medical History (Gen Tenchoe) Poetry and composition (Geshe Tenpa Tashi) Handwriting (Gen Yeshe Gelek)	(No preliminary year required)		

	TIDWELL TIMELINE	MTK SEMEST-ER	MTK CURRICULUM	SLL SEMEST-ER	SLL CURRICULUM	TT Intern-ship
May-Dec 2011 (Sep-Dec Tawni at Emory)	EMORY Sep-Dec third year PhD program — Emory Neuroscience Core, human biology, grant apps, qual studies; memorizing *Root Transmission*	*preliminary year)*				
Jan-Feb 2012	EMORY Jan-Feb third year PhD program — Qual studies	WINTER BREAK		LOSAR & SPRING FESTIVAL		
March thru July 2012	EMORY Mar-April third year PhD program — Quals, Comprehensive Exam Studies (MTK classes recorded)	Year One (Mar thru Dec 2012)	*Root Transmission* (ALL) *Explanatory Transmission* (Ch 1,4,8,9,10, 31) Buddhist Logic Astrology ETMS Prelim Session	Year One (Aug 2011 thru July 2012)	*Root Transmission* (ALL)	
	MTK May: Arrive MTK May 2012: First exam (TT: failed) Jun: Emory-Tibet Medical Science (ETMS) Course Prelim Session at MTK: Carol Worthman June & July: classes					
August 2013	MTK: 1st Medicinal Plant Expedition (26 days), no Exam		1st Medicinal Plant Expedition (26 days), no Exam	Year Two (Aug 2012 thru July 2013)	*Explanatory Transmission* (ALL)	
Aug thru Dec 2013	MTK Classes: *Explanatory Transmission* (Ch 2,3,6,7,11-16) Buddhist Logic Astrology *Root Transmission* Allegorical Tree Dec: First annual exam (TT: 100% oral exam)		*Explanatory Transmission* (Ch 2,3,6,7,11-16) Buddhist Logic Astrology *Root Transmission* Allegorical Tree			

	TIDWELL TIMELINE	MTK SEMEST-ER	MTK CURRICULUM	SLL SEMEST-ER	SLL CURRICULUM	TT Intern-ship
March thru July 2013	MTK Classes: *Explanatory Transmission* (Ch 16-20,23-26) *Oral Instructions Transmission* • Comp 1: Start *Nyépa* • Comp 2: Start Mazhuwa • Comp 3: Start Heat Disorders *Subsequent Transmission* • Sxn 1: Start Diagnostics Buddhist Logic Astrology ETMS Session #1	Year Two (Mar thru Dec 2013)	*Explanatory Transmission* (Ch 16-20,23-26) *Oral Instructions Transmission* • Comp 1: Start *Nyépa* Disorders • Comp 2: Start Internal Disorders • Comp 3: Start Heat Disorders *Subsequent Transmission* • Sxn 1: Start Diagnostics Buddhist Logic Astrology ETMS Session #1			
August 2013	Colorado for China visa — transfer to Amdo (Xining); MISSED: 2nd Medicinal Plant Expedition (21 days) & Exam		2nd Medicinal Plant Expedition (21 days) & Exam			

	TIDWELL TIMELINE	MTK SEMEST-ER	MTK CURRICULUM	SLL SEMEST-ER	SLL CURRICULUM	TT Intern-ship
Aug thru Dec 2013	XNN Year Three Curriculum TT Completed: • Comp 1: Nyépas • Phung Kham Kye Ched (Buddhist Logic) Year Four Curriculum TT Completed: • Comp 2: Hot Illnesses & Infectious Diseases (extra part that MTK does not have) • Comp 4: Upper Body Illnesses • Comp 6&7: Misc. Illnesses • Comp 13: Toxicology - *Recorded:* Diagnostics (*Explanatory*, *Oral Instructions*, and *Subsequent Transmission* chapters combined (unlike MTK)) (Year Two Curriculum)		*Explanatory Transmission* (Ch 20-22, 27-30) *Oral Instructions Transmission* • Comp 1: Start *Nyépa* Disorders • Comp 2: Start Internal Disorders • Comp 3: Start Heat Disorders *Subsequent Transmission* • Sxn 1: Diagnostics Buddhist Logic Astrology *Oral Instructions* *Transmission* Allegorical Tree	Year Three (Aug 2013 thru July 2014)	Year Three Curriculum TT Completed: • Comp 1: Nyépas • Buddhist Logic (*phung khams skye mched*) Year Four Curriculum TT Completed: • Comp 2: Hot Illnesses & Infectious Diseases (extra part that MTK does not have) • Comp 4: Upper Body Illnesses • Comp 6&7: Misc. Illnesses • Comp 13: Toxicology - *Recorded:* Diagnostics (*Explanatory*, *Oral Instructions*, and *Subsequent Transmission* chapters combined (unlike MTK)) (Year Two Curriculum)	TT specialized internship (1 yr): • Gastroenterology 4-5x/wk • Outpatient clinic 1x/wk (Dr. Dontse)

	TIDWELL TIMELINE	MTK SEMEST-ER	MTK CURRICULUM	SLL SEMEST-ER	SLL CURRICULUM	TT Intern-ship
Feb thru July 2014		Year Three (Mar thru Dec 2014)	*Oral Instructions Transmission* • Comp 1: Finish *Nyépa* Disorders • Comp 2: Finish Internal Disorders • Comp 3: Finish Heat Disorders Buddhist Logic Astrology ETMS Session #2		Year Three Curriculum TT Completed: • Comp 3: Internal Disorders • Comp 5: Vital & Vessel Organ Disorders • Comp 8: Coemergent Wounds(Cancer, Skin Illnesses, Piles, etc) Year Four Curriculum TT Completed: • Comp 9: Pediatrics • Comp 10 & 15: Gynecology • Comp 11: *Dön* Illnesses & Mental Illness • *Recorded*: Astrology • *Recorded*: Concluding *Subsequent Transmission* Chapters	
July & Aug 2014			(Batch 17 No Medicinal Plant Expedition)		Medicinal Plant Expedition (7 days) & Exam	
Aug thru Dec 2014			*Oral Instructions Transmission* • Comp 4-5 Buddhist Logic Astrology *Oral Instructions Transmission* Allegorical Tree	Year Four (Aug thru Dec 2014)	Year Three Curriculum TT has Completed: • Comp 12: Traumatology • Sxn 2: Pharmacology • Sxn 3 & 4: Therapies	TT internship rounds (5 mos): • All inpatient departments and one other outpatient doctor (Dr. Namlhakhar) (3 weeks per round)

	TIDWELL TIMELINE	MTK SEMEST-ER	MTK CURRICULUM	SLL SEMEST-ER	SLL CURRICULUM	TT Intern-ship
Feb thru July 2015		Year Four (Mar thru Dec 2015)	*Subsequent Transmission* • Sxn 2: Pharmacology ETMS Session #3 (first time Dr. Eley comes; Dr. Ted Pettus's 2nd year)	[Year Four (Jan thru July 2015)]	Year Three & Four Curriculum TT has to Complete: • *Recorded*: Comp 12: Traumatology (from Yr 3) JUNE EXAM • *Recorded*: Astrology (from Yr 4) JUNE PAPER • *Recorded*: Concluding Transmission Chapters (from Yr 4) JUNE EXAM/ PAPER Graduation Requirements TT has to Complete: • Write & present 10pp thesis • Four-year Cumulative Final Exams: (1) *Nyépa* Disorders & Internal Medicine (Internal Medicine with Vital & Vessel Organ Disorders); and (2) Diagnosis GRADUATION CEREMONIES JUNE & JULY	
August 2015			(Batch 17 No Medicinal Plant Expedition)			
Aug thru Dec 2015			?? Buddhist Logic Astrology *Subsequent Transmission* Allegorical Tree			TT personal practice in Atlanta (July 2015 - present)
March thru July 2016		Year Five (Mar thru Dec 2016)	?? *Subsequent Transmission* • Sxn 3&4: Therapies ETMS Session #4 (run by Dr. Bill Eley & Dr. Ted Pettus)			March - April 2016 Internship with Amchi Khenrab seeing patients at Drepung Loseling (Atlanta)
August 2016			??(No Medicinal Plant Expedition)			

	TIDWELL TIMELINE	MTK SEMEST-ER	MTK CURRICULUM	SLL SEMEST-ER	SLL CURRICULUM	TT Intern-ship
Aug thru Dec 2016			?? Buddhist Logic Astrology *Four Medical Transmissions* Summary Allegorical Tree and Medicine Benefits memorization Making medicine (*rkamg 'bam gsang sman, phye ma; ril bu zhig*) with Gen Lobsang Soepa; Corpse dissections Multi-day (approx. six days) of three-hour long exams covering all *Four Medical Transmissions*			(Atlanta)
Internship		Year Six (Mar thru Dec 2016)	Internship (1 yr): • MTK outpatient clinic (No thesis)	Year Five	Internship (8 mos): • 6 mos Tibetan medicine hospital • 2 mos Western medicine hospital (Chinese) Graduating Thesis	
Graduating Exam (and Thesis)		At end of Year Five	Three weeks of exams before internship Graduation after internship (no exam) No thesis. May elect to recite རྒྱུད་རྩ་། རྒྱུད་གསུམ། or publish a book	At end of Year Five	Two days of exams: 1) Nyépa Disorders & Internal Medicine (Internal & Vital & Vessel Organ Disorders); and 2) Diagnosis Write & present 10-15pp thesis (*written with guidance of faculty mentor)*	
Board Certifying Exam			NONE. Final cumulative exams at Men-Tsee-Khang qualifies graduate as Tibetan doctor.	At end of Year Six (after one year of working in a hospital or otherwise)	Major nationally recognized exam covering all of *Four Medical Transmissions*, plus national healthy policy and legislation	

***Note: MTK requires 5 years coursework plus one year internship; SLL requires 4 years coursework plus one year internship, a thesis, and board exam.*

Appendix 6
Rlung-tsab case field notes
Case study in Chapter 2
(field notes example)

Patient #23a

Initial Diagnostic Moment (February 18, 2014)

The new patient arrived in the gastroenterology department on February 18, 2014. She was accompanied by her husband, entering the physician office to see Dr. Drukjal for her initial patient interview. She sat on the bench next to his desk, her hands folded into each other in a reserved and quiet demeanor. She seemed a bit nervous and cast her gaze downward shyly — slightly more than the normal northeastern Tibetan female conduct tends to display.

I had been studying Tibetan medicine formally in HH's institute of Tibetan medicine Men-Tsee-Khang in India for the first two years of my education, and now I was completing my third year, having transferred to an area called Amdo (in Qinghai Province of China), the easternmost region of the Tibetan plateau. Amdo has been quickly becoming the global epicenter for Tibetan medical education and practice. Six months prior, I had begun shadowing the team of Tibetan doctors in the gastroenterology department of the seven hundred-patient bed hospital in the Qinghai Provincial Tibetan Medical Hospital.

Most students do not begin formal interning until they complete their full four years of Tibetan medical eduction. However, I was integrating clinical exposure and training alongside my coursework, an arrangement only available to unorthodox cases like the only foreigner studying at the Tibetan medical school — myself. I had also been spending one day per week in the outpatient division of the hospital with one of the most senior doctors in the hospital, Dr. Dhondup Tsering, or Dr. Dhontse, for short. In a given morning, he would see around thirty patients, often up to a hundred patients by afternoon, on Mondays. Despite my familiarity with patient protocol in the hospital and an initial patient interview, I felt nervous beginning the patient interview. She was the first patient my mentor had given me to manage on my own — from hospital admission to discharge.

"She's all yours," Dr. Drukjal proclaimed. He was sitting at the computer in the physicians' office inputing patient data from our morning rounds. The new patient looked at me, wide-eyed, likely quite surprised by the foreigner in a white doctor's coat (as all interns like their senior counterparts are required to wear by hospital policy) that was just deemed her managing physician. "Don't worry," I quickly said to her, "I am just a medical student, he is your real doctor and will be the one actually taking care of you." She nodded.

"What seems to be the problem?" I asked her. "My lower abdomen (Tib. *rgyu-zhabs*) hurts — it has hurt for over five or six years, and the pain has worsened in the last month — so I thought I should come in," she said, in a spurt of words that seemed uncharacteristic of her initial demeanor. "What else?" I asked. "My stomach hurts," she pointed under her rib cage, just below her sternum. "Does the pain worsen after you eat?"

I asked. "No," she responded. "How about with oily foods?" I probed further. "There doesn't seem to be a difference," she said, "I often feel nauseous." "No difference when hungry or while eating either?" I asked. "It hurts a bit more without food," she said. "How about differences in the pain in your lower abdomen?" I asked. "Afternoon," she said, "It hurts more then, and I have a lot of bloating."

"How are your menstrual cycles?" I asked, "Regular?" "Regular," she said. "How long?" I followed. "Three to four days," she said. "Color?" "Red, like normal," she said. "Do you experience much pain, headaches?" I asked. "No," she said, "No pain, no headaches." "But I feel itchy, especially when I urinate," she said. "Do you have a lot of discharge?" Dr. Drukjal's intern interjected. "Yes," she said. "How is your lower back pain (Tib. *mkhal rked*, lit. "kidney-back")?" I asked. "It hurts." "Difference between right and left sides?" I asked, "No, no difference," she responded. I was building her case by now.

"Do you get dizzy easily?" I asked, referring to a classic symptom associated with the Tibetan medical condition that was emerging. "Yes," she answered, "And headaches." I reached for her right wrist to take her pulse. Familiar with the Tibetan medical diagnostic protocol, she offered it as soon as I started to reach. Her left wrist pulse was average in its flow with some drop-off on the tail end of its pulses. Her heart pulse was floating and unsteady, characteristic of *rlung*. Her liver pulse was a bit hot — taut with more of a pounding quality. Her stomach pulse seemed a bit inflamed but not overly so. Her kidney pulses were a bit hot for her overall pulse signature. And her *samseü* (Tib. *bsam se'u*) pulse, a pulse often connected with the reproductive and neuroendocrine system, was a bit prominent and hot. Her lung pulse was reserved and quiet. "Do you experience sensitivity along your spine when I press?" I asked, applying pressure at the *rlung* points along her spine. "Yes," she said reacting to the pressure, "That's painful." She had not brought her urine in for examination as many of the Yushu patients and Tibetans residing in India often do.

Thus far, it seemed like a *badkan mükpo* (Tib. *badkan smugpo*) issue with *mo-nad rlung tshabs*. I had originally thought her symptoms were showing up as intestinal inflammation (Tib. *rgyu tshad*), but Dr. Drukjal corrected my understanding of the colloquial term "*rgyu-zhabs,*" meaning "foot of the small intestine" or lower small intestinal region. Pain in this area is much more linked with lower abdominal cramps characteristic of gynecological conditions and menstruation. The rest of her symptoms made more sense with his clarification.

"How are your bowel movements?" I asked, "Do you have dry stools (Tib. *bshang ba skam po*)?" "Yes, dry stools, often" she said. "Color?" "Yellow," she said. "Smell?" "Smelly," she said. There seemed to be quite a bit of *mkhrispa* in her system, despite the *ma-zhu-wa* (cold-derived condition of metabolic disruptions) underlying conditions and *rlung* exacerbating influences.

"Are you a nomad or a farmer?" I asked, determining lifestyle between the two dominant types in the region. "Nomad," she said. "Where's your home area?" She responded with an area I had not heard of. "Same *phayul* [home area] as Dr. Loden," said Dr. Drukjal for clarification.

"I also have low blood pressure 90/60," she added. This information surprised me since her pulse did not seem to indicate low blood pressure. I knew the nurses just took her blood pressure when she arrived in the department, and they would continue to monitor her vitals three times per day for the first three days, so I made a mental note to check their continued assessments.

"How is your mind [recently]?" I asked. "Aggravated," she said. "When just resting or when interacting and engaging with people, thinking and so forth?" I asked further. "When I am just thinking," she said. "How is your sleep?" I asked, "Dreams?" "Sleep is good," she said, "Not sure about my dreams."

"But my knees hurt a lot in cold weather," she said. "How about your wrists? elbows?" I asked. "Wrists, no. Elbows, yes," she said. A complicating case of *drum-vu* (Tib. *grum bu*), I thought, which makes sense with the stomach and *ma-zhu-wa* issues, as well as the type of gynecological condition.

"Stick out your tongue," I requested. Pink, moist, and thick with white coating (Tib. *bad kan*). "Do you have an acidic taste in your mouth?" I asked. "No," she responded. "How is your hunger?" I asked. "Good," she said. Although I had observed hundreds of patient interviews by this time, this particular interview seemed to impress upon me the respective roles that the symptomology and pulse take in providing the diagnosis. The symptomology was critical to narrowing into the diagnosis, whereas the pulse seemed to provide primary and relative organs of concern with the level of severity. I would imagine that the pulse would play a greater role in the diagnosis as I developed in my diagnostic skill and clinical practice. However, as a novice, the symptomology seemed critical in providing the diagnosis.

"Alright, what's your diagnosis? Primary and secondary conditions?" Dr. Drukjal asked me with a playful smile on his face, knowing he was putting me on the spot for the first time with a patient diagnosis. "Well," I said, "I want to investigate a urinary bladder infection due to the pain on urination and a possible yeast infection," I said, "And then the *gyu-tsay* (Tib. rgyu tshad) does not seem quite right with what you told me about the term *rgyu-zhabs*, so…" He handed me a piece of paper with his diagnosis: *rlung-tshabs and pho-tshad*. "Of course, we will run all the other diagnostics, but her's is a pretty classic case," he said. I realized I had not had the gynecology course yet and my lack of knowledge and practical experience here was evident. Months later, looking back on this case, it does seem classic, but at the time, the symptoms were confusing to me with the other GI conditions.

"Okay, what's your prescription?" he asked. I started fumbling through my notes of previous patients with similar conditions. I had not memorized the medicine chapters yet, and felt quite unprepared to perform this task. Check it out in the *Zintik Yangtik*, he said, handing me one of commentary texts often referenced in clinical practice. Aha, I thought, of course — it's a quick reference. I didn't even think of looking up the symptoms there. I realized to what degree this handbook has become a central reference guide for new doctors in the field. I looked up the respective chapters and made a prescription that addressed the various conditions she had and *nyépa* influences that I had assessed through the pulse and symptoms.

Upon handing my prescription to Dr. Drukjal, he said, "Okay, overall good, but we don't have many of these medicines — like this medicine, or this one, or this one, or that one." He crossed off the unavailable medicines successfully and wrote other medicines in their places. He added a medicinal wash for her urinary tract and yeast infection. "What do you think about this?" he said, handing me the new prescription. "Looks good," I said. "Alright, go ahead and submit it," he said. I entered the information in the patient database, navigating the Chinese commands with his intern's assistance, and submitted the prescription in her patient file on the hospital computer network. She had gone to get her blood and urine taken, EKG and computer radiographs (CRs) and ultrasounds of her abdominal region.

Tibetan Medical Diagnosis

In the diagnostic style of the hospital, her official Tibetan medical diagnosis was:

> General Condition: gynecological condition (Tib. *mo nad*)
> Specific Condition: *rLung*-aggravated *Tsabs* illness (Tib. *mo nad rlung tshabs*)
> Concurrent Conditions: gastric inflammation (Tib. *pho tshad*); heart *rlung* condition (Tib. *snying rlung*)

Biomedical Diagnostics (translated by author from Chinese)

1. CR (X-ray). Result: "Both lungs, heart, and diaphragm are visible without abnormality." TT: Uterine enlargement most often result of uterine leiomyomata (proliferations of smooth muscle that are benign neoplasms). (Test date 2014.02.18)
2. Ultrasound: "Cervix enlarged." (Ch. *gongjing feida*) "Pelvic cavity amassing liquid." (Pengqiang ji ye). TT: Peritoneal fluid accumulation? If so, concerning conditions include: ovarian carcinoma, ruptured tubal pregnancy. Otherwise, small accumulations may be result of menstrual cycle. (Test date 2014.02.18)
3. H. pylori confirmation (Test date 2014.02.20)
4. Ultrasound: Chronic cholecystitis (Ch. *manxing dannangyan*) (Test date 2014.02.20)
5. Ultrasound: Chronic cholecystitis (Ch. *manxing dannangyan*) (Test date 2014.02.22 reconfirmation)
6. EKG (Test date 2014.02.18):
   - Sinus nature of heartbeat is delayed (Ch. *dou sing xindong guo hua*n) — long QRS intervals 90-92ms, where 6-12ms is normal)
   - Heart rate 57 beats/minute (Ch. *xinlü* 57 *ci/fen*)
   - Axis unpolarized (Ch. *xin dian zhou bupian*)
   - Roughly (more or less) normal EKG (Ch. *dazhi zhengchang xindiantu*)
7. Vaginal discharge bacterial growth test (Test date 2014.02.20): no bacterial growth over 48-hr period.
8. Order form for medicine allergy test and bacterial growth. (Test date 2014.02.18) (No results seen on form.)
9. Blood serum UA (Ch. *xue qing*) lab. (Test date 2014.02.19). Elevated ASO 146 IU/mL (normal <116). TT: Clinical significance is past or present streptococci infection?

10. Stool test (*fen bian*) lab. (Test date 2014.02.19). Yellow, soft. Negative: no bacterial growth.
11. Blood serum (*xue qing*) comprehensive lab. (Test date 2014.02.19). Elevated level of white ball ratio in metabolic panel is 2.1 (1-2 is normal).
12. Whole blood (*quan xue*) lab. (Test date 2014.02.19). Elevated levels of MPV 13.14 (normal 9.1-12.1 fL), P-LCR 47.04 (normal 17.5-42.3%), and PDW 18.34 (normal 9.9-16.1 fL)
13. Blood serum (*quan xue*) Hepatitis, HIV, TB, etc panel. (Test date 2014.02.19). All negative.
14. Urine test (*niao ye*). (Test date 2014.02.19). High WBC levels 5 units/HPF (normal 0-3).
15. Leukorrhoea (*bai dai*) vaginal discharge test. (Test date 2014.02.18). White-yellow color. Level III sanitary level (normal I-II).

Biomedical Diagnosis
1. Gastritis and H. pylori (Test dates 2014.02.18 and 2014.02.20)
2. UTI and yeast infection
3. Specific diagnosis undetermined, but cervical inflammation was assessed (Test date 2014.02.18)
4. Chronic cholecystitis (Test date 2014.02.22)

Correlated (Tibetan & Biomedical) Diagnostics
1. Inflammation of uterus (CR & ultrasound) and *rlung-tshabs*
2. Heart *rlung* and delayed heartbeat (EKG test 2014.02.18)

Reflections on Diagnostic Learning Processes
Her diagnosis stemmed primarily from the reported symptoms and pulse analysis. CR and ultrasound confirmed initial diagnosis.

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