CHAPTER TWO*

WINTER WORM, SUMMER GRASS: *CORDYCEPS*, COLONIAL CHINESE MEDICINE, AND THE FORMATION OF HISTORICAL OBJECTS

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Early modern China was a transforming and transformative space. Under the reigns of the Kangxi, Yongzheng, and Qianlong emperors, Qing (1644-1911) landholdings doubled in size between 1660-1760. As a result, the Qing ultimately controlled a larger empire than the current People's Republic of China and included many distinct peoples within its borders.[1] The expansion of the empire in the late seventeenth and eighteenth centuries brought new plants, animals, and medicines into the Chinese material and textual tradition. As new objects came into Qing medicine and literature from the margins, the meaning of what was "Chinese" was reinvented and reconfigured to account for the changing boundaries of the empire.

This early modern imperial and colonial context has largely been written out of the history of Chinese medicine. While the idea of medical plurality has been attributed to the practice of Chinese medicine (especially by anthropologists and historians of modern TCM), and historians have increasingly acknowledged the importance of regionality in shaping notions

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and treatment of medical bodies in China, the move toward historicising medical plurality in China has generally not extended to exploring its cultural or linguistic hybridity in early modernity.[2] The associated practices and texts have been variously interpreted in relation to notions of tradition and modernity, but for the most part the historiography of Chinese medicine treats the idea of "Chinese-ness" unproblematically. The first goal of this paper is to add a new dimension to the historiography of early modern Chinese medicine by interpreting it as a colonial practice.[3]

I have a second goal as well. I also suggest that we take the historical construction of identity as an explicit problem in writing the history of Chinese medicine. At every level of inquiry the construction and identification of the objects of study is an integral part of historical practice. Despite the fact that they were constantly in flux over the course of early modern history, the identities of "China," of other indigenous (or "ethnic," or "ethnic minority") medicines, and of the natural objects that themselves made up these medicines are too often treated as stable entities that can be identified and individualised across time and space.[4] One need only to think of the contemporary practice of assigning Latin binomial nomenclature to classical Chinese plant and animal names as a common example of a seemingly innocuous practice that nonetheless is effectively a kind of textual or nominal imperialism: drugs are re-made and tamed into conveniently classifiable elements of a Linnean taxonomy, much as an increasing number of Chinese herbal medicines are epistemically transformed into bio-medical entities by being tested for active molecular compounds. As "alternative" or "complementary" herbal medicines are re-identified as "Chinese" in opposition to Western biomedicine or evidential medicine, reifications of the coherence of a Chinese pharmacological nationality has largely obscured the long history of medicine (and especially pharmaceutical medicine) in China as a fundamentally colonial practice. This brief essay seeks to

not only draw the process of historical identification of national, ethnic, and indigenous categories into the field of historiographical inquiry, but also begin to unearth the plural histories of the creatures, plants, and minerals that were used in the drugs themselves.

What does it (what can it) look like to write the history of a creature, and what particular issues are endemic to identifying an object across colonial frames? Though scholars of environmental and scientific history increasingly urge a return to a creature-centered history in which the sub-human speak, going back to "the creatures themselves" in creating a history of plants and animals is not as straightforward a task as it might seem: it is not always clear what the critters-themselves were, in what sense (if at all) they were equivalent to modern entities, and what kind of violence we do to the geo-historical context of plants and animals in wrenching them into modern biomedicine.

I will focus on a particular case study that encapsulates this varied set of problems in one tiny little body. Caterpillar fungus has been taken as a performance-enhancer by Olympic athletes, prescribed for illnesses from headache to avian flu to cancer, and is currently hailed as one of China's medical treasures. This "winter worm, summer grass" (*dongchong xiacao*) has enjoyed immense popularity in recent years, journeying from distant regions of China and Tibet to the bustling international drug market. Stories abound of the ancient tonic, made into medicinal tea by China's earliest rulers and protected as one of the empire's most enduring and famed medical traditions since remotest antiquity. This paper traces the modern construction of this "ancient" Chinese medical drug as it transformed from a seasonally shape-shifting insect from the empire's eighteenth century boundary regions into a modern fungal tonic with an invented ancient provenance. The history of the erstwhile worm reflects not only the changing definitions and classifications of nature since late imperial China, but also reveals the politics,

economics, and foreign relations critical to constructing "traditional" medicine in the modern world. This tiny entity (or collection of entities) has had a pivotal role in transforming contemporary environments (through collecting, poaching, smuggling, and conservation efforts), empires (by occupying a crucial place in Chinese-Tibetan relations and the construction of "Chinese" medicine), and national identity-building.

The Case of the *Cordyceps*

In modern bioscientific terms, the genus *Cordyceps* is an ascomycete fungus that is parasitic on insect and arthropod larvae. Spores of the fungus infect the larvae, growing and filling their host with hyphae. When the host dies, the fungus produces a fruiting body that emerges from the insect or arthropod body and sends off more spores.[5] *Cordyceps sinensis* (the "Chinese Cordyceps," often equated with the "vegetable caterpillar" or "caterpillar fungus") is perhaps the most famous species in the genus. The fruit of this fungus has become one of the most popular and sought-after herbal drugs throughout the world and has lately been the focus of wide scientific research.[6]

For an ancient tonic with a pedigree that reportedly extends back hundreds of years, global recognition has come relatively late. Not until the 1990s did *Cordyceps sinensis* become a fashionable herbal remedy, often commanding exorbitant prices in pharmacies and other drug purveyors.[7] The engine of this transformation was a burst of news coverage in the Anglophone press resulting from a clever performance by Ma Junren, the successful Chinese track and field coach who regaled a room full of journalists at the 1993 China National Games in Beijing with the secret of his success: his record-breaking athletes breakfasted on *dongchong xiacao* 冬蟲夏草 ("winter worm, summer grass," frequently shortened to *chongcao* and equated with *Cordyceps sinensis*), a tonic that he claimed "Chinese people [had] been drinking…for hundreds of years."[8] By the late 1990s

Cordyceps/*chongcao* (used interchangeably in scientific and historiographical accounts) had become a popularly prescribed drug across East Asia,[9] and it featured prominently in debates leading up to the 2008 Beijing Summer Olympics over the relative utility or danger of using "traditional Chinese herbal medicines" in major athletic competitions.[10] Increasing demand for this reputed wonder drug has driven prices as high as the list of maladies a tonic made from *Cordyceps* will reportedly treat, with most of the worldwide supply imported from China.

It may come as a surprise, then, that this reputedly ancient, traditional Chinese tonic is neither ancient nor traditional, and (depending on how you define "China") arguably not Chinese. What is now known as "caterpillar fungus" did not appear in Chinese language texts until the mid-eighteenth century, at which point it was understood as a completely different type of creature. The following account traces the history of a practice rather than that of an object. *Dongchong xiacao* and *Cordyceps* are not obviously the same object, or even the same kind of thing, despite the current tendency to treat them as alternate names for a single being. The entities denoted by these names arguably occupy very different epistemic spaces in the contexts in which they emerged. It is instead the practice of synonymy since the eighteenth century that has equated these entities and mashed them into the singularity that they seem to represent today. I will argue that this equation has ultimately come at a significant cost.

Transformations

The cartographic, ethnographic, political, and social ramifications of Qing expansion have been well documented.[11] However, despite its relative absence in the historiography of medicine, the Qing imperial project also profoundly restructured the medicine and natural history of the period. Imperially-sponsored cartographic projects mapped the new territory, and local gazetteers listed and described the products and customs

of the areas coming under Qing rule. On the heels of a commercial publishing boom in the mid-sixteenth century, many printed editions of medical books and encyclopedias were available, and they often included lists of recipes and medical drugs available in the pharmacological marketplace.[12] Qing pharmaceutical works increasingly incorporated materials from the borderlands of the empire, making greater use of gazetteers than earlier collections of *materia medica* had done and often emphasising the importance of local variation in drug types, names, and usage.[13]

Among the new drugs to be included in Qing texts was a hybrid creature called *dongchong xiacao* or *xiacao dongchong*. A brief account in the *Sichuan tongzhi* 四川通志 [Sichuan Gazetteer] of 1731, a local gazetteer that was later republished in the *Siku quanshu* compendium [The Emperor's Four Treasuries] of 1782, is likely the first recorded instance of the term in Chinese. In 1950, Wu Jingzi briefly mentioned the stuff in his fictional account *The Scholars* (*Rulin waishi*), depicting it as an exotic delicacy obtainable in major urban markets.[14] It did not appear in Chinese-language medical texts until 1751, when it was noted in the *Bencao congxin* 本草從新 (a compendium of *materia medica*) in a short account that was elaborated in pharmacological texts thereafter.[15] The creature appeared, for example, in the 1848 *Zhiwu mingshi tukao* 植物名實圖考, a compendium of botanical knowledge:

> *Bencao congxin*: *Dongchong xiacao* [winter worm, summer grass] is cold and level, protects the lungs, improves the kidneys, stops bleeding, breaks up phlegm and ends persistent cough. It is produced in Yunnan and Guizhou. In the winter it lives within the earth, its body like an old silkworm covered in hairs, and can move. In the summer it sheds its hair, emerges from the surface of the soil, rotates its body and transforms into a plant. If it is not harvested, it returns to the earth in winter and transforms

> back into an insect. Author's Note: This plant is plentiful in Guangdong and Guangxi regions (*liangguang* 兩廣). Its root is like a silkworm, its leaves look like the young sprout of an herb. In Yangcheng it is considered a delicacy, and it is said to be delicious. This is probably the same kind of thing as eating *hechong* 禾蟲 worms.[16]

Neither strictly animal nor vegetable, the *chongcao* was both: it lived as a worm and dwelt under the earth in the cold winter months, but when the ground warmed up in the summer it metamorphosed into a plant, burst forth, and was harvested for medical use.

Each of these earliest Chinese-language accounts shared a common means of describing *chongcao*. From its earliest instantiations in Chinese texts it was a decidedly local product growing in only certain regions of the empire. The particular place varied, but in each case *chongcao* was discussed as a product of some particular location. According to the *Bencao gangmu shiyi* 本草綱目拾遺 (1765) and many of the texts it cited, the *chongcao* grew in regions distant from the capital and cultural centers, such as Sichuan, Yunnan, Guizhou, and Guangdong. By the time the shape-shifter made it into the pages of Chinese literature and medicine in the eighteenth century, these early modern frontier regions were becoming integral to the empire.[17] The Qing conquest and consolidation of these borderlands was mirrored in Chinese medical texts by the integration of borderland medical drugs into the pharmacological canon.

Though the earliest Chinese accounts of "winter worm, summer grass" described it as a shape-shifter that was only a plant for half of its life, it tended to be classified with plants, specifically as a mountain herb (*shancao* 山草), in collections of *materia medica*. Though much of the *Zhiwu mingshi tukao* material cited above recapitulates earlier accounts of the drug, this botanical encyclopedia of the mid-nineteenth century represents a crucial period in the history of the drug. Author Wu Qijun not

only followed the lead of earlier pharmaceutical (*bencao*) texts like the *Bencao congxin* in classifying the pharmaceutically relevant part of the *dongchong xiacao* as a plant. In addition, he added a note calling the substance a "plant" (*cao* 草) explicitly, explaining that though the root might look *like* a silkworm, the critter was very much a plant and not a shape-shifting creature. This was a significant epistemological transformation, as an exotic, metamorphosing, taxonomical boundary object was re-imagined into an herb that fit securely within a botanical text. Thus this expensive drug, difficult to obtain outside of a handful of major cities and prized by connoisseurs, underwent one textual and conceptual transformation: from a metamorphic frontier-being into an herb found within major urban centers of the empire.[18]

At roughly the same time, *chongcao* underwent a parallel transformation. The material had appeared in European texts some decades earlier than in Chinese accounts, in descriptions that largely mirror its later treatment in mid- to late-eighteenth century Chinese-language texts. The *dongchong xiacao* was first mentioned by René Antoine Ferchault de Réaumur in 1726 (as "Hia Tsao Tom Tchom").[19] It was then famously described by Jean-Baptiste Du Halde (as "Hia Tsao Tong Tchong") in his 1736 *Description de la Chine* (*General History of China*).[20] After a brief account of its appearance, Du Halde marveled at its value. A great rarity and little-known delicacy that was seldom seen in the capital of Beijing, the drug apparently hailed from the far reaches of the empire (in Tibet or Sichuan) and was so rare that it was only prescribed by the Emperor's physicians at court.[21] Building on these European accounts, famed British mycologist Miles Joseph Berkeley re-christened *chongcao* as a fungus in the mid-nineteenth century. Berkeley gave the drug a new name to subsume it within the Linnaean taxonomies he studied, and *chongcao* became *Sphaeria sinensis* (and was soon afterward renamed as *Cordyceps sinensis*). By adding the "*sinensis,*" Berkeley also made it definitively Chinese. Thus *chongcao* became *Cordyceps*, and the shapeshifting plant became a fungus.

A vitally important series of shifts in geographical and epistemic locality is hidden in this history of nomenclature. The current tendency within the historiography of Chinese medicine to equate all of these entities with "*Cordyceps sinensis*" obscures the fact that each act of renaming and reclassifying this rare and expensive material fundamentally changed both its nature and the nature of the local or national group to which it belonged. These transformations in name mirrored simultaneous transformations in China's involvement in imperial and colonial endeavors. The relationship becomes even clearer when we turn back to what may be the earliest documented history of this collection of epistemic entities.

Dbyar rtswa dgun 'bu

As it turns out, Chinese *Cordyceps* may not originally have been Chinese at all. *Dongchong xiacao* may ultimately have been a Tibetan import into Chinese texts as part of a Qing movement to translate Tibetan works in the seventeenth and eighteenth centuries. The court had established a Tibetan School (*Tanggute guanxue*) in 1657 to train scholars for translation work, and Tibetan language training peaked in the eighteenth century along with a substantial increase in the printing of Tibetan books.[22] Given this context and the timing of the emergence of the drug into Chinese texts, *dongchong xiacao* may well be a translation from the Tibetan *dbyar rtswa dgun 'bu* (also commonly rendered "yartsa gunbu"), or "summer grass, winter worm,"[23] approximately equivalent to the Chinese: *dbyar* (summer); *rtswa* (grass, herb); *dgun* (winter); *'bu* (worm). The intended synonymy of these terms is underscored by the fact that both the Tibetan and Chinese names appear in a description in the later *Mengyao zhengdian* 蒙藥正典, a nineteenth century Tibetan text on Mongolian medicine, illustrating a further national wrinkle in the story.[24] In part because the expensive *dbyar rtswa dgun 'bu* is not widely employed in modern Tibetan medical practice, its history

as an object of exchange among Chinese, Tibetan, and Mongolian contexts has largely been erased from its treatment in the historiography of Chinese medicine.[25] This is part of a larger trend in which local, indigenous medical drugs and traditions (Tibetan, Mongolian, Uighur, Dai, etc.)[26] have been redefined as "ethnic minority" medicines in Chinese-language medical historiography, with the history of early modern Chinese empire as a colonial force and of medicine in China as a result of intermingling of distinct local traditions essentially disappearing.[27] *Chongcao* is just one example of a much larger story that remains to be told.

In addition to being the center of a debate over its "nationality" and origin, the caterpillar fungus has triggered heated political and social debate in contemporary Asia. The poaching of caterpillar fungus has become an important issue for conservationists, as farmers eager to collect this valuable drug sneak onto nature reserves to search out their bounty. According to mainland Chinese officials and journalists, the local farmers deserve to be punished because of the havoc their activities wreak on the local environment: burning protected trees as firewood while camping out in search of the fungus, stripping tree bark to make tents, trapping wild animals for food.[28] Tibetan and Nepalese supporters claim that, in contrast, this phenomenon shows the exploitative and imperial designs of the PRC: as China declares more and more of the land they claim in Tibet and Nepal as "nature preserves," they grant themselves the right to unfettered access to valuable caterpillar fungus, stripping the rights of locals who have made their livelihoods collecting the valuable drug. The PRC demands heavy taxes on the collection of caterpillar fungus, charging locals for access to the resource and demanding a fraction of whatever is collected.[29]

With *chongcao*'s rise to international stardom, several court cases in recent years have featured locals from Qinghai (and other regions where the drug grows) robbing and killing people

in order to obtain supplies of the precious stuff.[30] As recently as July 2007, a gun and hand-grenade battle over local supplies to caterpillar fungus in the Tibetan Autonomous Region left six people dead and over 100 more injured.[31] (The clash apparently took place on the way home from an unsuccessful attempt to urge the local magistrate to peacefully resolve the dispute.) Accounts have also linked *Cordyceps sinensis* to the Nepalese Civil War, as smugglers with ties to the Maoist Guerrillas secret the expensive fungus out of Nepal and into China for a handsome profit.[32]

The preceding cases illustrate the importance of this seemingly humble fungus in mediating and triggering larger issues of nature and empire: who owns the rights to land and the riches that grow within it? Chinese imperial interests in Tibet today are only the latest manifestation of a project and process that has continued for at least 300 years, as the ethnic, national, and local identity of the caterpillar fungus continues to be a pivotal and in some cases life-threatening issue.

Hybrid Objects and Chinese Colonial Medicine

> An isolated machine gun in the remote past is a pragmatic absurdity – and so, by the way, is an isolated machine gun in the present without the know-how, bullets, oil, repairmen, and logistics necessary to activate it…An isolated Koch bacillus is also a pragmatic absurdity since those types of facts cannot escape their networks of production either. Yet we seem to believe they can, because for science, and for science only, we forget the local, material, and practical networks that accompany artifacts through the whole duration of their lives."[33]

The transformations of *chongcao* have been manifold, from a shapeshifting boundary object (half-plant, half-insect) into a plant, and ultimately into a fungus, with several re-imaginings of

its national identity along the way. In addition, this rare and exotic delicacy has somehow become a symbol of the very essence of Chinese medicine itself. Today, *chongcao* is popularly cited in Chinese articles as one of the three great tonics (*sanda bupin* 三大補品) in the Chinese medical storehouse, along with *renshen* 人蔘 (ginseng) and *lurong* 鹿茸 (deer antler). In the twenty-first century it has become one of the most precious and sought-after local products in China. It is widely discussed in connection with its high value and (similarly high) places of origin: Tibet, Qinghai, Sichuan, Gansu, etc.

One important conclusion to take from this example is that the notion of creature-agency is potentially problematic. Collapsing a diverse collection of names, descriptions, qualities, and objects into a single plant or animal obscures the fact that these entities may have occupied very different epistemic roles in the literatures of which they played a major part. Something now known as "Caterpillar fungus" shifted from a part-time insect, to a plant, to a fungus, to a drug, and has been identified as Tibetan, Nepalese, "Chinese," and as the product of various localities within these larger units. Arguably, it must be understood as a different kind of thing in the different contexts in which it has emerged.

However, a question remains: what exactly is "it"? Is there a common "it" threading through these contexts at all? Even the present attempt to link the preceding entities though a history of synonymy, tracing the ways in which different object-terms have been equated in an effort not to assume their equation, is fraught with difficulty. History is ultimately a collection of stories, and the actors in those stories need names. The objects in the preceding mini-account of historical synonymy are linked in the meta-narrative of this article, and the use of concise historical rhetoric demands that the author devise a way to indicate what she is talking about without recourse to an increasingly elaborate and cumbersome series of notes in each instance of the use of each name: "The preceding account of

this seemingly humble fungus - though of course you must remember that the fungus and the *chongcao* and the *dbyar rtswa dgun 'bu* are different types of thing, and each name can itself refer to many kinds of thing, and I refer to the 'fungus' here for the sake of brevity and convenience, etc. etc. – in mediating and triggering larger issues…" Though the named objects thread the preceding historical account together, it is essentially a history of likenesses rather than the history of an object. In much the same manner as the Koch bacillus described in the quotation from Bruno Latour above, the objects of this article are not trans-historically identifiable things as much as they are bits of discourse that reveal networks of production. Each time one of these names is synonymised with another, a new set of relationships and a new series of networks is brought into existence. These practices of equation should be among the objects of our inquiry within the historiography of Chinese medicine.

How have scholars (now and in the nineteenth century) threaded these various names together and identified all of them as the same object? The identification has often carried a cultural or ethnic weight, as the name or textual origin of a creature can make it a metonym of a nation or group of people. The textual technologies (transliteration, analogy, phonetic reconstruction, identification through defining of crucial characteristics) that have enabled and shaped the linking of *dongchong xiacao*, *Cordyceps sinensis*, and *dbyar rtswa dgun 'bu* to each other have also been pivotal in transforming contemporary environments, empires, and national identity-building. The example also helps raise a question that seems less weighty but is absolutely critical to the study of the past: what does it (what can it) look like to write the history of a creature?

The answer is not simple. Many of the plants and animals studding the history of Chinese medicine have been translated *into* existence, while the network of practices and objects and people and events creating their various instantiations have been

translated *out of* existence. As a field we are happy to acknowledge and even celebrate the inherent instability of translations of *qi*, for example. The widespread tendency to leave such conceptual terms untranslated in the historiography of Chinese medicine illustrates a willingness to accept a plurality of epistemic objects related but not quite equal: *qi* and breath and spirit and steam may play together in the same sandbox, but they are children of quite different families. However, we take for granted the equivalence of terms for *materia medica*. Even the most diligent of scholars will occasionally find herself hiding between the comforting parentheses that are used ostensibly to explain what this flower or that root *really is*: thus, *Dongchong xiacao* (*Cordyceps sinensis*, or "caterpillar fungus"). This is a kind of intellectual laziness of which most of us are guilty, and it bears serious reconsideration.

There is no simple way out of this conundrum: we are historians, and in order to create a historical narrative one needs some sort of entity to follow through time. Perhaps, however, we might begin to ask different questions of health and healing in Chinese history, creating new narratives by re-focusing our historical lenses on practices and networks and resemblances. The clarity of the objects we think we see may well prove to be a dangerous illusion.

Notes

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[1] See L. Hostetler. "Qing Connections to the Early Modern World: Ethnography and Cartography in Eighteenth-Century China". *Modern Asian Studies*. 2000. Vol. 34. No. 3. P. 623-662 and *Qing Colonial Enterprise: Ethnography and Cartography in Early Modern China*. Chicago, 2001.

[2] Some examples of recent anthropological work that emphasises the importance of plurality to modern Chinese medicine are E. Hsu. *The Transmission of Chinese Medicine*. Cambridge, 1999; J. Farquhar. *Knowing Practice: The Clinical Encounter of Chinese Medicine*. Boulder, 1994; and V. Scheid. *Chinese Medicine in Contemporary China: Plurality and Synthesis*. Durham, 2002. The work of historian Nathan Sivin (for example, N. Sivin. *Traditional Medicine in Contemporary China*. Ann Arbor, 1987) also treats this theme, as do M. Hanson. "Robust Northerners and Delicate Southerners: The Nineteenth-Century Invention of a Southern Wenbing Tradition". *Innovation in Chinese Medicine*. Ed. Elizabeth Hsu. Cambridge, 2001. P. 262-291 and "Northern Purgatives, Southern Restoratives: Ming Medical Regionalism". *Asian Medicine*. 2006. Vol. 2. No. 2. P. 115-170.

[3] In calling Qing imperial enterprise "colonial" here I follow Hostetler 2000 and 2001.

[4] The idea of an "ethnic minority" *(shaoshu minzu*) is a construction of twentieth century Chinese discourse. Scholarship on the construction of ethnicity in modern China is a flourishing field, and it would be unwieldy to list all pertinent works here. Some excellent recent treatments of the topic include M.C. Elliott. *The Manchu Way: The Eight Banners and Ethnic Identity in Late Imperial China*. California, 2001; D. Gladney. *Dislocating China: Muslims, Minorities, and Other Subaltern Subjects*. Chicago, 2004; *Empire at the Margins: Culture, Ethnicity, and Frontier in Early Modern China*. Ed. by P.K. Crossley, H.F. Siu and D.S. Sutton. Berkeley and Los Angeles, CA, 2006; and T.S. Mullaney. "Coming to Terms with the Nation: Ethnic Classification and Scientific Statecraft in Modern China, 1928-1954." PhD Dissertation. Columbia University, 2006.

[5] For those who are familiar with the zoological curiosities of the Museum of Jurassic Technology, the "stink ants of Cameroon" are a play on *Cordyceps*-infected bugs. This idea has

travelled further in contemporary media to also infect the recent Quay brothers film, *The Piano Tuner of Earthquakes* (2006).

[6] Some examples of recent scientific literature on *Cordyceps* include Ø. Stensrud et. al. "Accelerated nrDNA evolution and profound AT bias in the medicinal fungus Cordyceps sinensis". *Mycological Research*. 2007. Vol. 111. P. 409 – 415; Y. Ito and T. Hirano. "The Determination of the Partial 18 S Ribosomal DNA Sequences of *Cordyceps* Species". *Letters in Applied Microbiology*. 1997. Vol. 25. P. 239-242; and N. Kinjo and M. Zang. "Morphological and Phylogenetic Studies on *Cordyceps sinensis* Distributed in Southwestern China". *Mycoscience*. 2001. Vol. 42. P. 567-574. I am grateful to Kevin O'Neill of Montana State University for bringing this literature to my attention.

[7] Estimates of the cost of the fungus differ depending on which source you consult and what grade of the drug you are looking for. According to a recent article in the *China Daily* (Z. Chen. "Fungus turns Spotlight on Conservation Efforts". *China Daily*. May 31, 2006), while the fungus sold for only 20 yuan (about $2.50) per kilo in the 1980s, prices had skyrocketed to roughly 100,000 yuan (about $14,000) per kilo as of 2006. According to Hvistendahl 2007, the price per kilo was up to 19,000 GBP by late 2007. M. Hvistendahl. "Rich Pickings". *Financial Times*. London, November 24, 2007.

[8] Many newspaper and magazine articles covered this story. For representative examples from this prolific literature see J. Rodda. "Caterpillar fungus given credit for China's record-breaking run". *Guardian News Service*. London, September 16, 1993; D.C. Steinkraus and J.B. Whitfield. "Chinese Caterpillar Fungus and World Record Runners". *American Entomologist*. Winter 1994 (with Ma's quotation on P. 235); and I. Berkow. "A Steady Diet of Records on a Steady Diet of Worms". *New York Times*. February 1, 1994. For a later article introducing coach Ma and the drug scandals that would follow him for the next several years, see W. Ellis and I. Speck. "Turtles' Blood, Caterpillar

Fungus and Cigarettes: The Sinister World of Ma's Army". *Daily Mail*. London, September 08, 2000. For a fuller discussion of the history of *Cordyceps*, see also C. Nappi. *The Monkey and the Inkpot: Natural History and its Transformations in Early Modern China*. Cambridge, MA, 2009. P. 141-146.

[9] A 1999 study of Korean pharmacies found that *Cordyceps* was the most prescribed arthropod drug in 25% of the pharmacies studied, and the second most prescribed arthropod-based drug overall. See R.W. Pemberton. "Insects and Other Arthropods Used as Drugs in Korean Traditional Medicine". *Journal of Ethnopharmacology*. 1999. Vol. 65. P. 207–216. Several Japanese studies have also touted the medical efficacy of caterpillar fungus-based drugs.

[10] The concern over athletic doping in the 2008 Beijing Olympics provoked a renewed interest in explicating "traditional herbal remedies," "millennia-old elixirs" and associated claims regarding the power and potential dangers of traditional *materia medica*. In the months preceding the summer of 2008, remedies that were once considered trusted and nourishing tonics were banned for athletic use for fear that they might cause unpredictable results on doping tests. The China Anti-Doping Agency (*Zhongguo fan xingfenji zhongxin* 中國反興奮劑中心) released a list of drugs for athletes to avoid in preparation for the 2008 Beijing Olympics that included a "Chinese medicines" section (*Zhongyao bufen* 中藥部分) of banned medicines. See W.G. Cheng. "Deer Penis Loses Favor as China's Olympians Fear Drug Testers," *Bloomberg News*. http://www.bloomberg.com/apps/news?pid=20601109&sid=aCQ0IoTLiM.4&refer=home#. April 01, 2008. Accessed on 17 August 2008.

[11] See, for example, L. Hostetler. "Qing Connections to the Early Modern World: Ethnography and Cartography in Eighteenth-Century China". *Modern Asian Studies*. 2000. Vol. 34. No. 3. P. 623-662 and *Qing Colonial Enterprise: Ethnography and*

Cartography in Early Modern China. Chicago, 2001; P.C. Perdue. *China Marches West: The Qing Conquest of Central Eurasia*. Cambridge, MA, 2005; and *Empire at the Margins: Culture, Ethnicity, and Frontier in Early Modern China*. Ed. by P.K. Crossley, H.F. Siu and D.S. Sutton. Berkeley and Los Angeles, CA, 2006.

[12] On publishing in the late Ming, see L. Chia. "Of Three Mountains Street: The Commercial Publishers of Ming Nanjing". *Printing & Book Culture in Late Imperial China*. Ed. By C. J. Brokaw and K. Chow. Berkeley and Los Angeles, CA, 2005. P. 107-151, especially P. 135-136 on medical works, and J. P. McDermott. *A Social History of the Chinese Book: Books and Literati Culture in Late Imperial China*. Hong Kong, 2006, which treats the late Ming in each of its thematically-organised chapters. On the wide distribution and circulation of daily-use encyclopedias in the late Ming, see S. Wei. "The Making of the Everyday World: *Jin Ping Mei cihua* and Encyclopedias for Daily Use". *Dynastic Crisis and Cultural Innovation From the Late Ming to the Late Qing and Beyond*. Ed. By D. Der-wei Wang and S. Wei. Cambridge, MA, 2005, P. 67-74.

[13] Evidence of this comes from my own survey of Qing *materia medica* in comparison with Song and Ming pharmaceutical texts. For one example of this trend, see X. Zhao. *Bencao gangmu shiyi* [Correction of Omissions in the *Bencao gangmu*]. Shanghai, 1995 [1795].

[14] J. Wu. *The Scholars*. Tr. by Gladys Yang. New York, 1993. P. 295. The characters in Wu's text purchase *dongchong xiacao* in then-fashionable Yangzhou city. On the cultural history of Yangzhou from the late seventeenth century see *Lifestyle and Entertainment in Yangzhou*. Ed. by L. Olivova and V. Bordahl. Honolulu, 2009.

[15] See Y. Wu. 吳儀洛. *Bencao congxin* 本草從新. Beijing, 1990 [1751], P. 26. Some texts have argued that the first recorded instance of *dongchong xiacao* was in the *Bencao beiyao* in 1694. For example, see S. Li and K.W.K. Tsim. "The Biological and

Pharmacological Properties of Cordyceps sinensis, a Traditional Chinese Medicine That Has Broad Clinical Applications". *Herbal and Traditional Medicine: Molecular Aspects of Health*. Ed. by Lester Packer et al. Florida, 2004. P. 657-684. This attribution is a mistake: the drug appears not in the original *Bencao beiyao*, but in a later revision of the text by Hong Yuan, called *Zengpi bencao beiyao* 增批本草備要.

[16] Q. Wu. 吳其濬. *Zhiwu mingshi tukao* 植物名實圖考. Zhengzhou, 1993 [1848]. Vol. 3. P. 286.

[17] On Guizhou, Yunnan, and Sichuan on the southwest frontier of China, see J.E. Herman. "The Cant of Conquest: Tusi Offices and China's Political Incorporation of the Southwest Frontier". *Empire at the Margins: Culture, Ethnicity, and Frontier in Early Modern China*. Ed. by P.K. Crossley, et al. Berkeley and Los Angeles, CA, 2006, P. 135-168.

[18] In the epistemic landscape of Chinese-language herbal texts, the mountains had long acted as a kind of borderland region in which it was less surprising to find metamorphosis such as that of the *chongcao*.

[19] See M.J. Berkeley. "On Some Entomogenous Sphaeriae". *London Journal of Botany Vol. II*. Ed. by W.J. Hooker. London, 1843. P. 207-208. The full citation provided by Berkeley is R. A. Ferchault de Réaumur. *Mémoires de l'Académie des Sciences*. 1726. P. 302. Tab. 16.

[20] See J-B. Du Halde. *The General History of China*. London, 1736. Electronic reproduction. Michigan, 2003. Vol. 4. P. 41-42.

[21] Ibid.

[22] On language training see G. Tuttle. *Tibetan Buddhists in the Making of Modern China*. Columbia University Press, 2007, especially P. 28-29. On Qing printing of non-Han texts see E.S. Rawski. "Qing Publishing in Non-Han Languages". *Printing and Book Culture in Late Imperial China*. Ed. by C. Brokaw and K. Chow. Berkeley and LA, 2005. P. 304-331. Though most of the

translated texts were religious in content, many included plants, minerals, or creatures used in healing purposes.

[23] Today the drug is also popularly known by many names in many national contexts. It has been argued that the Chinese term *dongchong xiacao* is actually a translation of a Tibetan name first mentioned in a Tibetan medical text in the work of fifteenth-century Tibetan doctor Zur mkhar mnyam nyid rdo rje. I have not found confirmation of this claim. On this Tibetan medical figure, see R. Rinpoch. *Tibetan Medicine*. Berkeley and LA, 1973. P. 21. In his treatment of Sino-Tibetan loan words, Berthold Laufer identified *dongchong xiacao* as a Tibetan loan *from* Chinese. In the end, whether the name was originally Tibetan or Chinese is less important than the fact that it was a contested object that lived in both languages and medical literatures.

[24] See Qiangbeiduojie 強貝多傑 (Also rendered Zhanbuladao'erji 占不拉道爾吉; Tibetan: 'Jam-dpal-rdo-rje). *Mengyao zhengdian* 蒙藥正典 (Tibetan: Mdzes mtshar mig rgyan). In *Zhongguo bencao quanshu*, Beijing, 1999. Vol. 396. P. 261. On the historical interweaving of Mongolian and Tibetan medicines, see C.R. Janes and C. Hilliard. "Inventing Tradition: Tibetan Medicine in the Post-Socialist Contexts of China and Mongolia". *Tibetan Medicine in the Contemporary World: Global Politics of Medical Knowledge and Practice*. Ed. by L. Pordie. London and New York, 2008. P. 40.

[25] On the use of *dbyar rtswa dgun 'bu* as a trade item on the Tibetan plateau, see A. Boesi. "dByar rtswa dgun 'bu (Cordyceps sinensis Berk): An Important Trade Item for the Tibetan Population of Li thang County, Sichuan Province, China". *The Tibet Journal*. 2003. Vol. 28. No. 3. P. 29-42. According to Boesi, the drug is understood as a metamorphosing worm/grass (similar to its eighteenth century instantiations in Chinese texts) by Tibetan gatherers.

[26] I use the language of "tradition" here bearing in mind that many of the indigenous medical traditions identified today are in

fact modern constructions and hybrid, changing entities. Janes and Hilliard 2008 provides an excellent discussion of the operation of this concept in modern Tibetan and Mongolian medicines, as well as a brief introduction to the tangled history of Tibetan medicine within the context of modern Chinese political history.

[27] On medical "ethnicity" in modern China see D.M. Glover. "Up from the Roots: Contextualising Medicinal Plant Classifications of Tibetan Doctors in Rgyalthang, PRC". PhD Dissertation. University of Washington, 2005. P. 70-78. For an example of the nationalist re-imagining of "ethnic" medicines as a kind of exploitable natural resource for modern China, see L. Ji. *Zhongguo shaoshu minzu chuantong yiyao daxi* 中國少數民族傳統醫藥大系 [*Collection of Chinese Minorities Medicine*]. Chifeng, 2000. Tibetan medicine (*zangyi* 藏醫) is treated on P. 3-190.

[28] Z. Chen. "Fungus turns spotlight on conservation efforts". *China Daily*. May 31, 2006.

[29] See K.T. Lama. "Crowded Mountains, Empty Towns: Commodification and Contestation in Cordyceps Harvesting in Eastern Tibet". PhD Dissertation. University of Colorado, 2007, an anthropological study of the implications of the harvesting and commodification of *Cordyceps* in Tibet, and its political ramifications.

[30] See, for example, H. Zhang. 张慧宁. "'*Duoming' chongcao: Qinghai teda qiangjie chongcao, sharen xilie an jishi* '夺命' 虫草：青海特大抢劫虫草，杀人系列案纪实" *Zhongguo shenpan xinwen yuekan* 中国审判新闻月刊. May 2006. P. 29-32.

[31] M. Chan. "Villagers killed in clash over medicinal fungus". *South China Morning Post*. July 18, 2007.

[32] T. Bell. "Nepalese Army, Rebels Vie for Lucrative Trade in 'Himalayan Viagra'". *The Globe and Mail*. Canada, August 2, 2004. A9.

[33] B. Latour. "On the Partial Existence of Existing and Nonexisting Objects". *Biographies of Scientific Objects*. Ed. by L. Daston. Chicago, 2000. P. 250.