INTRODUCTION

This book is about the use of animals as drugs in the state medicine of modern China. Historians in recent years have produced a rich literature explaining Chinese medicine as a complicated, varied, and evolving set of theories, practices, and materials, rather than a clearly codified and unchanging tradition.[1] Much of this scholarship has been directed toward early Communist-period innovations that brought global recognition to Chinese medicine, such as new acupuncture therapies, the barefoot doctor program, and the isolation of the antimalarial drug artemisinin, to name but three. Medicinal animals, on the other hand, have largely escaped historical attention. This is despite many of them being products of this same period and having had an equally important, albeit largely negative, impact on the reputation of Chinese medicine as a domain of healing.

Animal-based drugs arguably fall into the category of "less orthodox therapies" that, as Bridie Andrews points out, were "explicitly rejected" as subjects by some influential Western historians of the 1970s and 1980s "in their efforts to upgrade Western perceptions of Chinese medical accomplishments."[2] This was despite the almost frenetic development and deployment of animal-based drugs in China during the same decades. The growing contemporary concern with wildlife conservation, animal ethics, and zoonotic diseases provides even more reason for those with similar instincts to find the subject uncomfortable. Yet as the field of science studies has taught us, the perception of illegitimacy, unorthodoxy, or controversy of a scientific (or

medical) project is all the more reason to take a closer look.[3] Indeed, a focus on medicinal animals can contribute to a more complicated picture of how Chinese medicine has been shaped since its state-supported institutionalization in the 1950s, particularly its increased materialization in the form of new drugs and drug therapies. It also represents an opportunity for historical scholarship to inform current and ongoing ethical and political debates with wide policy ramifications.[4]

With the coming of globalization, demonstrating the efficacy and safety of Chinese medicine, particularly its drugs, has become a major preoccupation of institutions that support and promote it. This has generated an infrastructure of laboratories and test protocols, laws, and regulatory bodies that increasingly mimic or parallel those clustered around biomedicine.[5] The greater sanction this has given to Chinese medicine has not quelled all skeptics and has even generated debate within that domain on the legitimacy of using biomedical theories and benchmarks. But one has only to look at its expanding global constituency, its recognition by international health organizations such as WHO, and the recent award of a Nobel Prize to a researcher self-identified with the field to see that acceptance of Chinese medicine's efficacy, safety, and utility has been on an upward trajectory in the early twenty-first century.[6] Even the COVID-19 pandemic has become an opportunity for the Chinese state to increase its already-strong promotion of Chinese medicine in the domestic health-care system, and as an element of "soft-power" politics abroad.[7]

The "animal issue" in Chinese medicine, on the other hand, has become only more charged and controversial with time. If Chinese medicine retains an Achilles' heel in the present century, it is the widespread perception that it is contributing to a holocaust among wild creatures, reducing biodiversity, and in so doing supporting a global criminal enterprise the profits of which rival those of narcotics and arms trafficking.[8] Nor is the animal issue entirely divorced from that of efficacy, as medicines based on the parts and tissues of endangered species are regularly condemned in the global media, and by some Chinese physicians, as being as ineffective as they are unethical. The naming, poaching, and trafficking of so-called medicinal species has dramatically increased in the current century and spread to even more areas of the globe, leading to the perception, as an article in *Nature* framed it, that "traditional Asian medicine is on a collision course with wildlife conservation."[9]

The animal issue sows division not only between two growing global sociocultural movements (alternative/indigenous medicine and species conservation), but also among individuals, groups, and institutions within

Chinese medicine, both in and beyond China. At stake is their shared understanding of Chinese medicine's history, trajectory, boundaries, and ethics. Some Chinese medicine practitioners have declared animal drugs, particularly those from endangered species, to be outside the scope of their practice, particularly following the Chinese government's ban on the importation of tiger bones, rhino horns, and other parts of endangered species in 1993.[10] This policy was, as Volker Sheid points out, convergent with the government's increased efforts to promote Chinese medicine abroad as a global health practice.[11] More recently, however, with the intensified promotion of Chinese medicine across Asia and the world as part of China's Belt and Road Initiative, other powerful voices have reaffirmed medicinal animals as a fundamental ethnomedical resource. Some have even challenged critiques by conservationists as "Western," despite a growing movement for animal conservation in China, among the Chinese diaspora, and within the realm of Chinese medicine itself.[12] The announcement by China's State Council in 2018 that it would even lift its ban on the medical use of "farmed" tiger and rhino parts, and its subsequent rare about-face due to global and domestic protest, demonstrates that tensions over medicinal animals have only been intensifying as the sixth mass extinction continues apace.[13]

As this book goes to press, the COVID-19 pandemic is bringing this controversy over medicalizing wild animals to an even wider audience, and fundamentally changing the nature of the debate. Regardless of which species passed the virus to humans, or exactly how and where it was transmitted, the pandemic has broadened the animal issue in Chinese medicine beyond ethics and efficacy to include the specter of zoonotic disease. The response of the Chinese state to the increased profile and notoriety of faunal medicalization has so far been mixed. Pangolins, which were early identified as a possible intermediate host for the virus, and have heretofore been the most heavily trafficked of all medicinal animals, were officially removed (with caveats) from the Chinese pharmacopeia in 2020. Yet the state's heavy promotion of Chinese medicine as potentially alleviating COVID-19 symptoms has not excluded the lucrative bear bile industry, despite there being legitimate herbal substitutes for its product. How the pandemic will affect the medicalization of animals in the long term remains to be seen, but better understanding the history of this process will do much to clarify its relation to Chinese medicine more generally, and hence the possibilities of reform.[14]

In debates involving medicinal animals, all parties usually accept the chronological and discursive space of "thousands of years of use" in China, thus arraying history against positions based on ethics, efficacy, or even public

health. By focusing attention on a more recent and clearly defined period—the 1950s through the 1980s—this book will add significant nuance to such arguments, lightening "the weight of the past" as an impediment to serious discussion about the present and future. The chapters that follow locate the increased deployment of animal-derived Chinese drugs in a largely unexplored place and time: drug discovery, innovation, and production in early Communist China. This realm of experiment-based activity was influenced as much by modern political policies, slogans, economic incentives, institutional priorities, and in some instances foreign sources of knowledge and practice, as by long-standing traditions of use by the Chinese people. Pharmacological policy in the early Communist period initially concentrated on plants, and fauna only gradually came to loom as large on the agendas of medical reformers, mainly from the time of the Great Leap Forward. Many of the animal-based medicinals or therapies of the early Communist era were new innovations, some were locally specific practices suddenly promoted on a national scale, and some represented new powers and efficacies suddenly bestowed on old and familiar substances.

The "experimental future" of animal-based therapies that emerged in the Mao period, this book argues, is the historical underpinning of Chinese medicine's present animal-based dilemma. The most commonly stated explanation for the rising consumption of animal drugs in the current century—that Chinese have become rich, so can "finally" afford what they have always craved—is in that sense ahistorical. A heightened degree of awareness, desire, and, above all, industrial production had to develop behind such drug-taking practices first, and here the history of the early Communist period is an overlooked watershed. A range of new animal parts and tissues in many varied forms became increasingly common in Chinese medicinal circulation from the late 1950s onward, thus habituating a large population to using more of it, more often, and for more reasons than ever before. The new enthusiasm for animal parts and tissues did not have its roots only in Chinese practice, moreover, but was influenced as well by external factors such as Soviet organotherapy and North Korean bear bile extraction technologies. Once the scope of this change and the mechanisms behind it is understood, the contemporary scourge of endangered species in Africa, Southeast Asia, and China appears not just as the continuation of a tradition. It is also the result of an evolving interest in and appetite for animal-based drugs, which increased in breadth and range from the early Communist period onward.

Faunal Medicalization

The phenomenon I call *faunal medicalization* was the process of fashioning and refashioning animal-based drugs for service to Chinese state medicine and, in the import/export realm, the larger Chinese economy. One has to be clear from the beginning, however, that animal-derived medicinal compounds have a long use in China, as they have in some (but not all) indigenous medicinal practices elsewhere in the world.[15] More than four hundred are listed or discussed in the sixteenth-century *Bencao Gangmu*, and both their numbers and the types of ailments they were meant to treat only grew and became more refined in subsequent pharmacopoeias.

When asked about the reasoning and utility behind the use of animal parts in materia medica, Chinese physicians among my informants often refer to slogans or sayings taken from classical literature, for example *yi du gong du* (using poison to attack poison), and *yi xing bu xing* (using shape to nourish shape). On the strength of the first slogan, animal venom such as that of snakes and scorpions would be advisable to use in treating fatal diseases. *Xing* in the second saying, basically referring to organs or parts, is often interpreted to mean that a particular animal organ or part can help nourish the same human organ, or one of similar appearance.[16] This also accounts for the medicinal attraction of the plant ginseng, which resembles the human body, and of walnuts, which resemble the brain.[17]

Animal parts are also referred to in classical sayings such as *xuerou you qing zhi pin* (products with passion in both blood and flesh) or *bu yi jingxue* (enriching and benefiting essence and blood), suggesting that they have more vitality or power than plants. Zu Shuxian believes that "animal medicine originated from the worship of animals," which would place them in a different ontological category than herbs.[18] Like much else in Chinese medicine, animal-based drugs have magical origins. Michel Strickmann reminds us that cow bezoar, to take one example, was once "the most highly prized of all medicines" in China because of its demon-dispelling qualities.[19] The medical doctor turned anthropologist Johann Frick found that magical attributes were still considered important to a drug's efficacy in the village in Tsinghai province, where he lived just prior to the Communist Revolution: "Magic and medicine are inseparably associated in the minds of the people, so that even when the medicines are 'good,' in themselves, greater confidence is often placed in the magic power than in the strictly medical effects. The people see superhuman forces at work in every sickness, so that when merely natural healing agents are pitted against them these latter must be endowed with

higher than natural powers." Frick lists many animal-derived (and human-derived) substances that had such properties in his village, most of which involved not killing their hosts but harvesting renewable tissue (e.g., dung, urine, and the webs of spiders).[20] Animal-derived materials were more often accompanied by herbs in physicians' prescriptions as part of a complicated polyherbal recipe, but even then they often stood out as the most dynamic components.

According to He Shaoqi, the phrase *bu yi jingxue* was coined by the famous Tang physician Sun Simiao, known as the King of Medicine (*yaowang*).[21] Sun Simiao was also, however, "the first Chinese author to have devoted a separate section of a paradigmatic nature to questions of medical ethics," according to Paul Unschuld.[22] And the use of animals as medicine was among Sun's ethical concerns:

> Whoever destroys life in order to save life places life at an even greater distance. This is my good reason for the fact that I do not suggest the use of any living creature as medicament in the present collection of prescriptions. This does not concern the gadflies and the leeches. They have already perished when they reach the market, and it is therefore permissible to use them. As to the hen's eggs, we have to say the following: before their content has been hatched out, they can be used in very urgent cases. Otherwise, one should not burden oneself with this. To avoid their use is a sign of great wisdom, but this will never be attained.[23]

There is even a legend associated with Sun in which he heals a wild tiger by extracting a donkey's bone from its throat, and the animal remains with him out of gratitude, even carrying his medical bag.[24] Sun's example is often cited by those contemporary practitioners and users of Chinese medicine who advocate expunging animal parts from the Chinese pharmacopeia. Many other classical writers, however, included animal-based ingredients in what were otherwise plant-based recipes or prescriptions, along with minerals, and even parts of the human body, such as placenta.[25] The issue of efficacy aside, it was more likely scarcity and expense rather than ethics that kept animal parts subsidiary to herbs in the historical development of the Chinese pharmacy.

In the contemporary urban Chinese medical marketplace, however, animal-derived components are startlingly abundant, from whole lizards and ground beetles, on the lower end, to bear bile and cordyceps at the higher one, and rhino horn and tiger bone in illicit corners.[26] Although this cornucopia may appear traditional to both buyers and sellers, many of its elements are new not only in their availability and uses, but also as a lived

set of practices and materials. With globalization, even species with no prior status as medicinal, or any prior relationship to China, have taken their place in this market. The spontaneous medicalization of jaguar parts by Chinese construction gangs working in South America, for example, has caused Vincent Nijman to describe Chinese engineering projects in forested countries, many driven by the Belt and Road Initiative, as "giant vacuum cleaners of wildlife," sucking any available exotic animal tissue into China's medical marketplace.[27] In a like manner, the recent medicalization of the gills of manta rays has been attributed to Chinese seafood salesmen, who, faced with a declining shark fishery, created a multimillion-dollar market for what was formerly a waste product.[28] China is of course not the only Asian society in which some people have bestowed new curative powers on both familiar and unfamiliar species, as attested by the well-publicized case of elite Vietnamese businessmen seeking African rhino horn as a hangover cure.[29]

Much of the modern discussion of Chinese medicinal animals focuses on tigers and rhinos, given their current endangerment, the huge profits involved in their trafficking, and their shared charisma as apex species. The most trafficked of all medicalized animals in the early twenty-first century, however, is likely the lowly pangolin, added to the Convention on International Trade in Endangered Species (CITES) list of critically endangered species in 2016, and removed from the state-managed Chinese pharmacopeia only in 2020 because of its possible association with COVID-19.[30] Rhinos, tigers, and pangolins share the attribute of wildness, often considered a central attraction for consumers of animal drugs. Yet neither wildness nor exotica can explain the perceived potency of the blood of chickens, which became one of the most important animal drugs during the Cultural Revolution, nor the fact that the majority of medicinal species, then and now, are actually farmed. Likewise, village donkeys are being skinned alive by poachers in Africa because of their perceived medicinal benefits in China, leaving their already-poor owners further impoverished.[31] If we are to understand the modern rise of animal-based drugs and therapies in a more holistic way, we must recognize that faunal medicalization is a process potentially inclusive of all species, yet one that has arisen in relation to specific political contexts, economic imperatives, and inventive strategies with heretofore opaque origins.

The range and voraciousness of faunal medicalization centered on China and its diaspora, according to one journalistic account, extends "far beyond anything that TCM authorities are able to discourage or contain."[32] Just who "TCM authorities" are, however, and to what degree they have discouraged, contained, or advanced such practices, is not easily resolved. The surfeit of

animal parts in such places as Guangzhou's vast Qingping Market is sometimes dismissed as in the sphere of "folk medicine" and therefore outside the purview or concern of Chinese medicine as an organized community of scholars, practitioners, and regulators. It is indeed true that contemporary Chinese medical colleges and hospitals do not account for much of this animal-based materia medica in their instruction or clinical practices. But the boundary between "folk" and "classical" medicine, especially when it comes to the use of animal tissue, is not a hard one, and was in fact willfully confounded in the Mao period. As we shall see, authorities in the form of state actors, Chinese physicians, Western-trained doctors, pharmacists, agricultural researchers, and others were very much involved in initiating the current wave of faunal medicalization, even if its goals, targets, and scale have now extended beyond what could have been imagined in the Mao and Deng eras.

Indeed, as the variety of animal parts in China's medical marketplaces has increased since the early Communist era, the numbers of animals cited in published, physician-authored sources as "medicinal" has likewise burgeoned. If we can take the four hundred animals in the *Bencao Gangmu* as a historic baseline, they represent just a fraction of those medicalized in publications of the Mao and Deng periods, and continuing into the present day. With the publication of the two-volume *Zhongguo yao yong dong wu zhi* (Chinese medicinal animals) in 1979 and 1983, the number of such species more than doubled, to 832, capping a period of intense animal-drug discovery and farming over the previous three decades.[33] In the 2013 revised and updated version of this compilation, the tally of medicinal animals has grown to 2,341 (inclusive of subspecies). Thus while faunal medicalization may have its roots in premodern practice, it is neither bound nor overly determined by it. Indeed, the authors of the most recent edition cite the "30-year research progress of zoology and medicinal animals," which relied on "modern molecular biology and other emerging science[s] and technolog[ies]" as the reason for issuing a new edition.[34] Like medicinal herbs, whose variety has similarly increased in published compilations, animal tissue is the stuff of ongoing "research and development." In that sense its roots are as firmly planted in the laboratory as in the marketplace, farm, or legal or illegal trade network.

Innovation and Tradition

To their contemporary consumers, animal-based products hold the aura of tradition, and hence historicity. But under Mao, the allure of animal-based medicines was at least equally dependent on their being seen as "new

drugs"—the product of science-based innovation. That association has never fully abated, even if it is no longer foregrounded in the way such drugs are marketed. In that sense, historical research on faunal medicalization can also shed new light on the phenomena of innovation and invention within Chinese medicine and science in the early Communist period, and the way that fragments of the historical and traditional were spliced into this process.

The long-standing view of the Mao period, and particularly the Cultural Revolution, as antiscience has undergone significant revision in the last decade. Miriam Gross, for example, has described "scientific consolidation" as central to regime dynamics under Mao, by which she means the mass cultivation of pragmatic technical skills intended to spark "an experimental and innovative mind-set" for party-directed projects.[35] Likewise, Sigrid Schmalzer's work on scientific farming in the same period shows how innovation in agriculture relied on a "patchwork of methodologies" that "cannot easily be characterized as 'modern' or 'traditional'" but were, in all instances, declared to be "science."[36] The thrust of these and other recent studies is that innovation under Mao was broadly encouraged and cultivated, even if it required tying particularistic concepts of science, tradition, and politics together in new and contested configurations.

The promotion of innovation in this period likewise extended to the creation of new drugs and therapies within the domain of Chinese medicine. This has been well-chronicled in the case of acupuncture therapies and herbology, but not for animal medicines.[37] Medicinal animal farming and the proliferation of novel animal-based "cures" are nonetheless among its prominent examples. This period saw the training of a new class of pharmacists and pharmacologists uniquely experienced with both Chinese and Western drugs and geared toward research. Physicians with Western medical training were also induced for the first time to experiment with new therapies involving indigenous materia medica, while communes were encouraged to farm a wide array of formerly wild animals for medicinal purposes, some for home consumption and others for export. Through this convergence of agents and agencies, fueled by political ideology and pragmatic need, the types and quantities of animal-based drugs in the Chinese pharmacopeia began a process of expansion and reformulation that has continued into the present day.

The medicinal farming and drug-making sector in the early Communist period celebrated its own modernity and inventiveness while simultaneously tapping in to classical, folk, and literary references in concocting new animal-based products; this imbued such drugs with complex and overlapping claims to efficacy. Alongside a drug's historicity might be the

development of new delivery methods and protocols replicating those common to biomedicine. Chinese interest in Soviet medicine also sanctioned the spreading use of animal tissue, via mutual interest in "tissue therapy," while a shared ecosystem along the China-Soviet border encouraged such practices as medicinal deer farming on an industrial scale. The Maoist view that medical science and drug discovery should be projects inclusive of workers and peasants, with a strong emphasis on production, also contributed to the gathering up of new fauna as materia medica. At the same time, the ideological turn to folk medicine converted local animal-based cures into national practices with political sanction. By these and other means, a new matrix of mutually reinforcing associations—of science, socialist politics, low cost and efficiency, and, in some cases, even miraculous curative effects—were attached to an increasingly wide range of animal tissues, helping to propel their production or dissemination. This also extended to foreign trade, as Chinese-produced animal-based medicines became an attractive source of foreign currency in the capitalist Chinese diaspora, thus extending the charisma of these products beyond China's borders.

The long-standing characterization of faunal medicines as "products with passion" was also given new meaning through innovation. Traditionally used as an ingredient in polyherbal recipes, animal tissue was now increasingly a research material, and consumable substance, in its own right. Administered in "pure" form through injections or pills, some substances were promoted as able to cure diseases, such as cancer, that had tested biomedicine's limits. A premium was also put on quick action, in the manner of antibiotics, thus reversing the perception of Chinese medicinals as slow-working. The sense that Chinese medicine could offer "miracle cures" became pronounced in such Mao-period innovations as chicken blood therapy, and remains a propelling agent in faunal medicalization today, if not the clinical practice of Chinese medicine more generally.[38]

The values attached to faunal medicalization in the Mao period, however, were not always convergent with those driving the process today. Charging exorbitant prices for "authenticity" is characteristic of the present marketplace for animal-based medicines, and helps subsidize and expand the cross-border trade in endangered species, whereas substitution and economy were watchwords of many early Communist-period animal drug therapies. This may seem like an utter break with the past, but the medicinal animal farming that began in the early Communist period has arguably helped further the contemporary global assault on animals in the wild. The farming industry as developed under Mao not only habituated people to the use of faunal rem-

edies through increased availability, but also demonstrated that almost any animal, or animal part, could be rendered into a medicinal product for urban consumers. Although this would have its ultimate effect on species outside China with Deng's reforms and the rise of a Chinese consumer class, it began to have similar effects on species within China much earlier. Species extinction combined with market forces have subsequently made increasingly rare animal parts "good investments," and their soaring prices have given rise to a gifting economy, in which the medicinal animal might never actually be used as medicine, but only as an offering(s) to higher-status individuals who appreciate it as a form of insurance: either a miracle cure in case of medical emergency or an appreciating asset to hedge against a financial one.[39]

Pharmaceuticalization

The forty-year period I have chosen for this study, from the start of Communist government to the end of the first decade of Deng's reforms, is an iconic one in Chinese history, full of dramatic political events and accompanying slogans. I agree with Mei Zhan that "dynamic forms of traditional Chinese medicine emerge through particular kinds of encounters and entanglements."[40] Medicine and politics in this period were deeply entangled, and the material and therapeutic forms that emerged from their encounter were particularly dynamic. I have tried to be sensitive to how each major political shift affected my topic, and in so doing demonstrate the primacy of political policy in giving rise to the wider production of, and knowledge creation around, animal-based drugs. Communist-era policies and resulting slogans about Chinese medicine are well-known, but have rarely been studied with reference to pharmaceuticals and drug-making.

Stephan Kloos has challenged us to "take seriously the process of pharmaceuticalization as a defining but understudied moment in the ongoing modernization of traditional Asian medicines."[41] Animals aside, pharmaceuticals and drug-making under Mao has heretofore not been well documented, and has indeed occupied a subsidiary role in histories or discussions of Chinese medicine as a modern institution.[42] This despite the fact that pharmacology in this period developed an outsized importance within the world of Chinese science and medical research. A team of American pharmacologists, chemists, and other experts touring China in 1974 under the auspices of the National Academy of Sciences found that, "relative to other biologic sciences, pharmacology occupies an exalted position in the People's Republic of China, where the emphasis given to pharmacology is greater

than in many other countries. This distinction is, however, perhaps more the result of political action than of scientific achievement."[43] While a politically informed history of Chinese pharmaceuticals is beyond the scope of this book, it is necessary in the early chapters to account for the existence (and origins) of this large, varied, but little-understood industrial sector, in order to provide a baseline for the eventual emergence of animal-based drugs within and around it. As we shall see, animal-based substances were not of initial concern in the immediate postrevolution years and, even after becoming an important focus of research, were never exclusively the domain of state pharmacology and industrial production. But faunal medicalization under Mao clearly converged with the rising status of pharmacology, and thus provides a window into the growing materialization of Chinese medicine, which it has arguably come to exemplify. I therefore offer enough background in the history of pharmaceuticals in this period, in the early part of the book, to frame the emergence of animal-based substances as among its eventual products.

Chinese drug development in this period roughly followed what Laurent Pordie and Jean-Paul Gaudilliere describe as a "reformulation regime," in which "new traditional drugs" were crafted amid changed circumstances, which in this case were both political and economic.[44] Such drugs become the productive centerpieces of "Asian industrial medicines," the term Laurent Pordie and Anita Hardon prefer to "traditional Asian medicines" as better foregrounding their materialization and commodification.[45] More recently Stephan Kloos has deployed the term "Asian medical industries" to put even greater emphasis on the consolidation and size of this sector, which incorporates not just "industry" in its classical sense of manufacturing and marketing, but "the entire field of sociocultural, political, technological, scientific, and medical phenomena involved in the generation of surplus value (monetary and otherwise)."[46] Most analysis and discussion of reformulation regimes in Asian medical industries relate them to post–Cold War globalization. But Chinese drug development experienced some of the characteristics of an "industrial medicine" much earlier, first with so-called patent medicines in the Republican period, and later with the developments I chronicle under the early Communist regime. Terms like "market" and "consumer," however, seem somewhat misplaced when applied to China before the period of Deng's reforms, and are particularly inadequate for some of the drug-making practices I chronicle, which did not involve what could reasonably be called "consumable goods." The injection of chicken blood into one's buttocks or the drinking of goose blood directly from that animal's neck were

not practices that even China's state-owned drug manufacturers could easily commodify. Yet these and other seemingly eccentric innovations were not unrelated to larger and more organized projects like the farming of deer antlers for home consumption and export, the later farming and sale of bear bile, or the trade in rhino horns and tiger bones, a connection that would be obscured if one were to concentrate exclusively on marketable or packaged drugs and their circulation.

Given this book's focus on innovation and invention, I naturally spend more time among makers than among distributors or consumers. This concentration on "making" also reflects the bias in my sources, and the whole tenor of this period in Chinese political history, during which invention, innovation, and production were emphasized almost regardless of demand or need. There was clearly demand for Chinese medicinal exports, however, and I hope that understanding the push factors in mainland China will propel future research that traces demand (pull factors) for Chinese medicinals in Hong Kong, Taiwan, Southeast Asia, and even Korea and Japan, where market forces were more controlling. Mei Zhan has valuably described how Chinese medicine has been remade "through trans-national frames."[47] Animal-based drugs were prominent exemplars of this process. I refer not just to the obvious presence of a consuming diaspora in East and Southeast Asia, but less obvious research and production links to the Russian Far East, Korea, and Japan. Likewise, this period saw the intensified importation of exotic (now endangered) species into China from Africa and Southeast Asia, a topic of such continuing importance that it deserves a study in its own right, and for which the present book can provide only a baseline.

Terms

I use the term "Chinese medicine" (*zhongyi*) rather than its more popular and political English translation, traditional Chinese medicine (TCM), throughout the text to refer to the broad set of practices, theories, rituals, materials, beliefs, technologies, and the like that were bundled under that name by the early Communist period. I am sensitive to the fact that some practitioners and consumers of Chinese medicine withhold that term from many animal drugs, calling them "folk medicine," or arguing more broadly that Chinese "drugs" and Chinese "medicine" are different realms that should not be confounded. Such positions are partly grounded in historical usages, some of which I discuss below. But they are also partly a reaction to contemporary critiques equating all Chinese medicine with animal drugs, which is hardly

true or fair. Acupuncture, moxibustion, exercise therapies, and most herbal drugs and prescriptions have nothing to do with animals, and the variety of these materials and practices demonstrate Chinese medicine's diversity. But animal-based drugs are also, undeniably, within this domain. Arriving at, let alone policing, a definition of Chinese medicine is not my project, however. Most of the time I simply follow actors, authors, and informants in using this and other terms as they do, while sometimes pointing out contradictions or peculiarities in their deployments.

Most historians agree that the term "Chinese medicine" arose as a counterpoint to "Western medicine" as soon as the latter term began to be used in China.[48] The dyad is now so accepted, and has so informed the majority of scholarly and popular works on medicine in China, that it is not easily dispensed with. I have chosen to use the term "biomedicine" to refer to Western medicine, however, as it is not geographically directional. This will also cause less confusion when I introduce concepts from Soviet medicine, which has many of its own characteristics.

That said, almost all the Chinese medicines and medicinals I deal with in this period had hybrid elements and were influenced in some manner by their encounters with biomedicine, as well as their location within a twentieth-century socialist nation-state politically invested in their "survival," in one form or another. The slogans of the Communist regime through this whole period were insistent that Chinese and Western medicines mingle, combine, and learn from each other. In other words, for most of this period, the state had a strong bias against maintaining either system in pure form, were that even conceivable. Their relationship had grown complex as early as the Republican period, as Sean Lei points out, when the idiom "neither donkey nor horse" was used to disparage practices considered in between, which were nonetheless proliferating and would later be favored in the new Communist regime. Lei helpfully refers to this nascent process as "speciation"—the formation of a new type of modern medicine fundamentally different from what had come before.[49] Bridie Andrews uses the term "combination medicine" to make a similar point, and excavates the previously underrated Japanese influence on Chinese pharmacological research.[50] My own story supports our growing picture of Chinese medicine in this period as a self-consciously modernizing and highly experimental realm, and complicates it further by adding the influence of Soviet medicine, which included many therapies and research projects that never gained traction in "the West."

As with the term *zhongyi*, I use the term *yao* (drugs) in the widest sense to describe whatever actors believed to be medicinal substances. I reserve the

term "pharmaceuticals," however, mainly for drugs that were more mainstream or mass-producible, within biomedicine or Chinese medicine. The heads of frogs and the blood of geese, for example, were promoted and used as drugs, but the term "pharmaceuticals" is too evocative of lab-based industrial production to really fit such materials. The term "materia medica" is perhaps most useful, and thus conventional, in covering the broadest range of substances, as is the term "medicinals."

The word "science" is more problematic in the Chinese context than is "medicine," given that it did not exist in the Chinese vocabulary prior to the encounter with the West, but thereafter became deeply and explicitly intertwined with the politics of nation-building.[51] The concept was even personified as "Mr. Science" (*Sai Xiansheng*) after World War I, and later made into a verb (to scientize, or *kexuehua*). The Communist Revolution further distanced the word "science" from the sense of "investigation of nature," because Marxism itself was now presented as the ultimate science. Thus nearly everything under the early Communist regime was open to "scientization," including Chinese medicine. As Lei points out, "scientize is a word used almost daily in modern Chinese, Japanese, and Korean; many native speakers would find it puzzling that Westerners can do without it."[52] It likewise occurs regularly in my source material, very often as a substitute for specificity. Suffice it to say that almost every actor or speaker in these pages would have felt comfortable defending his or her own ideas or policies as advancing the scientization project. This is important to note, given that many lingering products of their actions are now presented as exclusively belonging to the realm of "tradition."

As for "animal tissue," this is my term to describe everything from discrete pieces of animals, such as gecko tails or deer antlers, to extracts such as goose blood or bear bile, or whole animals such as beetles, centipedes, or toads, when used as medicinals. As discussed, animal tissue has always been present in Chinese medical traditions, and has never been fully segregated from herbs, minerals, or even human tissue as an available medical resource category. But it began to stand out more sharply in the modern period, when it came to be distinguished by aggressive promotion, heightened production, and exalted claims for efficacy, such as the ability to "cure 100 diseases," reverse aging, or melt cancerous tumors. Animal tissue of course took on an additional political meaning with the rising interest in species conservation and the ethical treatment of animals in the late twentieth century, neither of which was a concern during most of the period I chronicle except as it related to ensuring a viable population for sustainable production.

Sources and Methodology

Partly because of the range of materials, actors, and practices one needs to tap in order to describe faunal medicalization during this period, organizing this topic into a single story line with a small set of characters or institutions at its center is not possible. Indeed, the dispersed and fragmented nature of the evidentiary base is likely another reason that the subject of animal tissue in Chinese medicine has not previously attracted historians, despite its importance and topicality. There was no well-bounded group or institution responsible for, or consistently involved over time with, this gradual change in Chinese materia medica. Agency has been dispersed and, hence, elusive. And even then, one can't transparently rely on statistics or facts, given the exaggerations and distortions of Mao-era documents. The evidentiary base comes down to a series of descriptions, claims, admissions, reports, proposals, and statistics, mainly in the form of articles in professional journals and reports. With a few exceptions, such as chicken blood therapy and the bear bile industry, the material is also difficult to organize as case studies.

Animals are, in other words, not found as a ready-made and presorted category in one or more discrete archives. The faunal medicalization of the Mao period resembles what Kloos has described elsewhere as an emergent "assemblage" that "doubles as an ontological entity and analytic-methodological approach."[53] Animals emerge here and there, in this article or that, in parts of biographies, and reports on production. One thus has to piece together many textual scraps to see them emerge at all. But emerge they most certainly do, and more and more strongly with time.

My major (though not exclusive) sources for this book are a wealth of untapped pharmaceutical journals, published from the 1950s through the Cultural Revolution, most of which are collected in the library of Guangzhou University of Chinese Medicine (GUCM). Within the constellation of Chinese medical universities, GUCM is particularly well respected as the most important such university in southern China. The faculty there was kind enough to host me through years of doctoral research, offering themselves as instructors, informants, and, in some cases, close friends. Despite my research location in southern China, however, the sources that I have used are mostly national and, with some exceptions (e.g., deer and bear), make little editorial reference to specific regions (even if individual articles and papers were written from such localities) but rather attempt to create a national discourse around practice(s) of drug-making. Besides providing insights into official policies, these journals and related sources also provided

a forum for the various groups and individuals constituting the loose Chinese drug-making community, from physicians and Western-trained doctors (who were also called *daifu*, an archaic term for physicians) to, more prominently, pharmacologists, pharmacists, medicinal farmers, and medical bureaucrats. Publications from this period sometimes give us glimpses of groups with particular interests, but at other times even the identity of specific authors is cryptic.

I have supplemented journal sources with books, yearbooks, published reports, pamphlets, and other types of texts produced by actors as disparate as elderly Chinese physicians, bear farmers, and ministry officials. Oral history has proven less useful as a tool, except in gaining the trust necessary to be referred to written sources by my informants. Most of the influences that led to the increasing use of animal parts after 1950 remain unclear to Chinese physicians themselves, because they occurred gradually, were spearheaded by other state or private actors, or have more recently become controversial and thus not so easily open to discussion. For example, everyone in the world of Chinese medicine knows that rhino horns and tiger parts are officially banned substances, but not all agree that they should be. Everyone is also aware of the ethical controversy around bear farming, and that the majority of Chinese are against it. There is also considerable embarrassment about chicken blood therapy, which is widely considered an isolated aberration of the Cultural Revolution. Indeed, any discussion of the Great Leap Forward and Cultural Revolution periods with foreigners is uncomfortable for some otherwise helpful Chinese. My key Chinese informants have greatly encouraged my research direction, however, and this book would not have been possible without them.

Outline of the Book

Chapters 1 and 2 provide a base for understanding the eventual rise of state interest in animal-based medicinals by tracing the birth of the state-owned Chinese drug-making sector in the early to mid-1950s. As there is no general English-language account of drug discovery and drug-making in early Communist China, these chapters fill that gap and create a foundation for the subsequent structure of the book. Together these two chapters cover the period up to 1958, or the threshold of the Great Leap Forward, when animal tissue begins to figure more prominently in Chinese medicine, and in my text.

Chapter 1 explains how a state-owned pharmaceutical industry was crafted through the creation of new factories, on the one hand, and the consolidation of older medicine shops, on the other. Bound up with these developments

was the emergence of *yao* (drugs) as a more clearly articulated area or field within Chinese medicine, and one more in line ideologically with Marxism's emphasis on materiality. The phrase "Abandon *Yi*, Retain *Yao*" (*Fei Yi, Cun Yao*), although pre-dating the Revolution, animated actual programs into the 1950s, when Mao argued for the preservation of *yi* as well, but in "combination" with biomedicine. Thus native herbs common in Chinese medicine were used by state enterprises in this period to create imitations of previously imported biomedicines. Land surveys were also conducted in various parts of China in a search for hitherto untapped medicinal resources. A keyword of the era was *chuangxin* (to innovate), and the new class of Chinese pharmacists (*yaogongshi*) was encouraged to take up that task rather than rely on tradition. I argue that herbs were much more a source of enthusiasm within state medicine of this period than were animal-sourced drugs, excepting those associated with brand-name Chinese medicine companies, which continued to deal in substances like rhino horn and tiger-bone wine. The relative absence of "Chinese" animals in the early state pharmacy demonstrates that their subsequent "scientization" and inclusion in the state pharmacy signals a new creation rather than a simple continuity with existing practices.

Chapter 2 looks at the Soviet Union's crucial influence on Chinese drug-making policies and practices in this same period, particularly in relation to faunal medicalization. "To Learn from the Soviet Union" was a well-used phrase in the early to mid-1950s, and Chinese articles on this theme abounded. The Chinese goal of making drugs from local raw materials was convergent with the experience of the USSR, which had to build its own pharmaceutical industry using domestic resources after the October Revolution. The Russian influence also complicates the category Western medicine, as certain Soviet pharmacological interests, practices, and theories were relatively unique. Chinese drugs such as ginseng and deer antler, for example, were also native to Siberia, and some Soviet experts sent to China studied Chinese materia medica in order to create cross-border knowledge. Just as significantly, the Soviet innovation of "tissue therapy," virtually unknown in the West, became widely popular in China and directly encouraged animal-based therapies. Chinese medicine's historic use of animal drugs in raw form alienated it from Western biomedicine, but such practices overlapped with Soviet promotion of organotherapy, which provided modern and scientific sanction for the Chinese fascination with faunal drugs.

Chapter 3 chronicles the rise of animal farming in modern China, beyond the farming of deer. It concentrates on the Great Leap Forward, when the stepped-up effort to drive production in all sectors led to a policy of intense

cultivation of plant- and (increasingly) animal-based medicinals. Based on Chinese pharmaceutical journals as well as English-language reports and official statistics found in Hong Kong archives, this chapter also traces the growing importance of the export-oriented sector to medicinal production. The list of farmed animals in this period grew to include tokay geckos, ground beetles, seahorses, and many other species. In so-called laboratory farms, crossbreeding experiments took place in an effort to increase and improve the quality of yields. Under the banner of production, the population was encouraged to find new uses for known animal medicinals at the same time they were taught, often for the first time, that certain animal-based substances had healing qualities. This expansion and institutionalization of medicinal animal farming and mass collection, based partly on the Sino-Soviet precedent of deer farming, brought animals of all kinds into the domain of state medicine.

Chapter 4 turns from an emphasis on production toward innovation, and extends discussion of the Great Leap Forward into the Cultural Revolution. Despite the increase in overall supply of both plant- and animal-based medicinals through systematic farming, most of the Chinese population did not have access to such products. The lack of medical care and supplies was likely one reason for the rush to discover, record, and legitimate folk-healing practices. Another was ideology. The turn to folk medicine resulted in an expanded repertoire of animal-based drugs and cures being incorporated into state medicine. The emphasis on innovation, however, also resulted in hybrid therapies promising miraculous cures using animal tissue, the most notable of which was chicken blood therapy, which I present as an important case study.

This chapter goes on to discuss animal-based drugs and therapies of the later Cultural Revolution, which went further down the path paved by chicken blood therapy. Claims of efficacy for these drugs reached well beyond treatment for "traditional" ailments, to include cancer and other conditions that biomedicines could not seem to cure, an attribute that has become standard in the marketing of many animal-based drugs today. At the same time, politics dictated that cheaper and more popular substitutes be found for luxury animal medicine like rhino horn, even as the cultivation of export animals like musk deer became more intense.

Chapter 5 traces faunal medicalization into the period of Deng's early rule and new policies related to market reforms. Medicinal animal production and use, having established a solid base under Mao, became even more popular as part of the official policy to enrich farmers, some of whom now became "entrepreneurs." Bear farming was the signature innovation of this period and was ultimately destined to create more controversy than even chicken

blood therapy, though for entirely different reasons. Historical documents suggest that bear farming first took place in North Korea before entering China via the northeastern border. Captive bears were farmed essentially for their bile, the healing properties of which were supposedly sanctioned by Chinese classical texts. Arguments for the efficacy of bear bile, however (and the types of ailments it could treat), were expanded in the twentieth century after the isolation of its active ingredient by Japanese scientists.

Interludes at Golden Boten City and Golden Bear Private Limited

No scholarly project emerges from a vacuum, so let me describe one of the several contexts that fostered mine. Like many Singaporeans of Chinese descent, I have taken Chinese drugs and consulted Chinese medicine doctors all my life, while simultaneously patronizing biomedical hospitals and clinics. And, like an increasing number of my countrymen, I have also been active in the cause of conserving wildlife and biodiversity in the Southeast Asian rain forest that constitutes our mutual home. For most Singaporeans of my age and younger, a Chinese medicine without animals of any kind is not only a preference, but a largely accomplished fact. Rhino and tiger parts have been largely eliminated across this city-state through undercover work by local NGOs in cooperation with a generally cooperative government, sensitive as it is to international opinion and respectful of international treaties like CITES. Even in Singapore, however, the elimination of endangered animals' tissues from the Chinese medicinal marketplace has not been complete. The horns of endangered saiga antelope continue to be sold here as I write, ironically because they have been promoted as a substitute for now-banned rhino horns and were stockpiled by medicine shop owners prior to the animal's CITES listing.[54] As for the surrounding Southeast Asian region, it continues to be "at the heart of the [global] wildlife trade," according to the organization TRAFFIC, with Singapore ironically acting as a major transshipment point because of the efficiency and status of its port.[55]

I first conceived this book during a working trip to a Chinese-owned bear farm in Laos in December 2009. Shortly after joining a Singapore-based animal welfare organization, I was sent to what was then called Golden Boten City, a cross-border gambling den located in the most northern part of Laos bordering China's Yunnan province. Boten was then part of a Chinese development plan to convert an approximately two-thousand-hectare Laotian land parcel into a casino and recreational resort. It was to be the next Macau,

but one catering to regular Chinese people rather than high rollers. Sometime in 2009, my organization received a tip-off about a bear farm operation in the city that was possibly contributing to an epidemic, not only among captive bears, but also among other useful animals such as horses. Local authorities were worried that the disease would continue to jump the species barrier, in the manner of SARS or bird flu, and thus affect tourism. Our Australian veterinarian and Singaporean founder formed the first group to travel to Laos, intent on using the epidemic as an opportunity to save the remaining bears, and I followed a few weeks later.[56]

The journey to Boten City from Luang Prabang airport was a harrowing ride at breakneck speed through steep mountain roads, along which locals (some of whom had been evicted from Boten City) had built homes. Located right up against the Chinese border, Boten was so minimally connected to Laos that even the Laotian national currency was not accepted there, only Chinese yuan. Laotian police and border guards were present, but they seemed to defer to the Chinese who ran the city, and all were deeply connected to the casinos. We heard rumors of Chinese gamblers who could not pay their debts being murdered and their bodies dumped in the jungle.

Looking around the reception area of the hotel, I discovered a little booth at one corner selling "Chinese medicine" in red packaging, obviously meant to be purchased as gifts. I approached the Chinese lady sitting behind a glass display case full of boxes of bear bile products and asked to see one. The saleslady was no pharmacist. She had no answers to my questions about the medicinal uses of the products she was selling for very high prices. Like other products for sale in Boten, bear bile seemed to exist more within a gifting economy than a medicinal or curative one. On the other hand, the medicinal capital invested in bear bile was real and powerful, and, as I would learn in time, the product was intended to sell itself with little need of physicians, pharmacists, or other medical professionals to give it further sanction.

The following day, I was brought to the actual farm where the bear bile products I had seen the previous evening were made. It was nestled in a hill overlooking the city and next to a house belonging to the farm owner. Inside were two rows of cages supported on thin metal rods the height of a five-year-old child. Most of the cages were empty because so many bears had been killed by the epidemic, but two adults and one cub had survived. The adults were hardly recognizable as bears because they had rubbed most of their fur off against the bars of the cages and had grown very long toenails through disuse of their feet.

As for the cages, they were terribly small. There was an adjustable plate in one that, I later found out, was for pinning down the bear so that the farmer

and his assistants could go underneath and "milk" her from a catheter permanently placed in her gallbladder, down which bile would drip. As I absorbed the scene around me, one adult bear reached his paw out to the farm owner, who in return extended his and touched the bear. I asked the owner what he thought their relationship was, and his reply was, "We are just like family." He was, however, sporting a huge scar on his face, evidence of being mauled by one his captive bears.

The team from Singapore was invited to drink hard liquor every night with the police chief and the head representative of the development company, as was Chinese custom, while negotiating the surrender of the bears and other wild-caught animals, such as the iguana hanging in cages at a nearby restaurant. The town was full of wild animals in cages, many endangered, and nearly all illegal to trade under Chinese law. Those not eaten were likely destined for the trade in exotic medicinals or as pets. My companions were mostly nondrinkers (as is typical of Singaporean Chinese), which put them at a disadvantage in negotiating. As their junior, I was assigned to do most of the drinking. Boten City was a resort for Chinese gamblers, but is also close to a rain forest, and the farm owner had taken advantage of that convergence to market exotic animal medicinals to Chinese tourists. The casino owners had now lost patience with the bear farmer, however, so were cooperating with us in closing him down and repatriating the remaining bears. Their plan, however, was to still have the bears make money, as exhibits in a "bear sanctuary" or glorified zoo, which they hoped would be funded and run by animal-loving Singaporeans.

There were no Chinese doctors in Golden Boten City, no Chinese pharmacies, and no obvious sites of intersection with institutions of Chinese medicine. But there were many, many animals and animal parts being sold as medicine by people who could offer little explicit advice on how such substances should be used. The animals themselves were not Chinese (i.e., not living in China prior to being caught) but Laotian. Moreover, Boten City was one of a number of such gambling/medicine sites that exist close against the border of China and its Southeast Asian neighbors. In all of them, exotic animals from the surrounding forests were being sold for high prices as medicine to Chinese gambler-tourists, who were perfectly healthy at the time of purchase. In Boten, ironically, even sick and diseased animals were being converted to "medicine" for the comparatively rich and healthy, in an atmosphere of risk, danger, and criminality.[57]

A few years later, having decided to pursue animal medicinals as a scholarly project in the Edinburgh University–National University of Singapore

(NUS) Joint PhD Program, I traveled to China and was hosted during my archival research and fieldwork at the Guangzhou University of Chinese Medicine (GUCM). In this capacity I had the opportunity to accompany a professor of Chinese medicine on a visit to Golden Bear Company Private Limited in Conghua, Guangzhou, China's third-largest bear farm and a family-run enterprise. On entering its gates, Golden Bear is an impressive sight, different in every way from the decrepit appearance of the farm in the Laotian jungle. The central building, five to six stories tall, is covered with shiny yellow-tinted tiles, evidently to match the name of the company. It was literally gleaming in the sun on the day I arrived. The attached premises span roughly two hundred *mu*, or thirty-three acres, and the visitor can't help but be struck by its picturesqueness. Its centerpiece is a large man-made waterfall. A family member revealed in the course of my visit that the company planned to tap in to Conghua's reputation as a hot-spring destination to eventually turn Golden Bear into a *yangsheng zhongxin*, or health cultivation center, for tourists.

Unlike in Golden Boten City, it would be easy for visitors to Golden Bear to imagine they were entering a paradise for animals. But in fact the tall building is a factory, processing bile collected from an attached farm containing some four hundred bears. An additional two hundred are kept in Chaozhou, where the family had established their first enterprise—a zoo. The founder's son described the zoo as displaying all kinds of "queer gourds and fruits" (*shenqi gua guo*), as well as a crocodile, an ostrich, Bama pigs, a camel, and just a couple of bears. A 2001 visit to the zoo by a professor of Chinese medicine had induced the family to expand its horizons. Noticing the bears, he introduced the owners to the concept of bear bile farming and its potential for profit.

The Golden Bear grounds still have something of a zoo flavor. In addition to bears, they include a deer farm where easily a hundred deer are kept for their antlers, also a highly valued medicinal, which the company produces on the side. A camel (from the original zoo) is kept in a separate enclosure among scores of Bama pigs and piglets. Two trams take tourists on tours of this menagerie.

We proceeded to one of two lackluster cement buildings, which was full of bear cubs. Bears below the age of three are not suitable to have their bile milked, according to our guide, and so are kept separate from the adults (whom we were not invited to see). As we walked through the narrow walkway, the bears—two or three to each enclosure—approached the metal fencing between us. We stopped at one enclosure and our guide reached out to shake the paw of what looked like an enthusiastic bear cub. On closer inspection, the paw was deformed. According to our guide, the cub was born

wild and had had its paw caught in a trap laid by poachers. Forest rangers discovered the bear, who then delivered it to the company.

This time the scene of hand (paw) shaking between farm owner and bear did not surprise me, as it had at Golden Boten City. I realized that farm owners use this gesture to convince visitors that their bears are not suffering, but are cooperative partners in a profitable venture. By showing us a bear that was formerly wild, trapped, and then rescued, the company also sought to demonstrate its existence as a pseudo-sanctuary. This image was further boosted by an official certificate recognizing the company's role in conservation efforts. Our guide stressed, however, that two-thirds of their bears resulted from captive breeding, while those caught from the wild were all "rescued" bears.

The company's customers are not only mainland Chinese, but also Hong Kong, Taiwanese, and Japanese dealers. A Japanese pharmaceutical company had even offered to buy the farm. Bear bile is an essential ingredient in making Japan's household drug *Sokko kyuushingan* (*Suxiao Jiuxin Wan* in Chinese), or simply *kyuushingan*.[58] It is also the main ingredient for *Matsui yuujingan*, an Edo-period concoction linked to the Matsui family. In fact, Matsui Yuji, the CEO of what is now Matsui Pharmaceutical Company, was on record as stating that no other animal bile could effectively replace bear bile as a medicine.[59] Our Chinese guide likewise dismissed Ursofalk, a synthetic substitute created by German drug-maker Losan Pharma GmbH in 1979, as not having the properties of "the real thing."

My last stop was in a reception hall, where the family's patriarch was waiting to greet me and my colleague, who was a high-ranking Chinese physician. I noticed on the table in front of us two shot glasses held firmly by a plastic supporter, just like two *temaki* rolls. The glasses were filled with a thick, golden-colored liquid, and before I could ask what it was, our host told us to "finish it in one gulp," as we would a shot of liquor. My companion did as he was told, but I was revolted on the first sip. The taste of raw, untreated bear bile is indescribable. I politely excused myself and went to the display section, where I saw different grades of bear bile tea, pure bile liquid and powder, all with elaborate packaging. These products had the trade name Professor Bear or *Xiong Boshi*. There were also various wine concoctions such as "bear bile-lingzhi wine," "deer antler and blood wine," and "deer antler-deer penis wine."

Before we left, I was induced to drink up the last of the bear bile in my shot glass by being reminded that ten milliliters of the stuff—the glass contained fifty—was worth at the time 600 yuan (or over 80 US dollars). Our host spoke enthusiastically about its benefits, including its ability to cure cancer and reduce pain in critically ill patients, and recommended drinking it every day as

a "natural antiseptic." Back in the hotel, I brushed my teeth twice and ate only desserts for dinner, but the taste of raw bear bile lasted in my mouth for hours.

Despite the different scales and situations of the two bear farms, their similarities were more pronounced than their differences. Both seemed to rely on their product to sell itself, producer and consumer having equal faith in the medicinal being potent and sanctioned by tradition. Unlike the farm in Laos, Golden Bear is a member of the China Association of Traditional Chinese Medicine (*Zhongguo Zhongyao Xiehui*), which is bear farming's strong lobbying arm. But in neither place is the presence of the Chinese physician, let alone the lab or the clinic, obviously apparent. In both places medicine is embedded within a menagerie, accompanied by visual and oral references to threatened forests, on the one hand, and zoos, wildlife sanctuaries, and tourism, on the other.

Bear farming may seem to illustrate the distance currently prevailing between the industrial production and use of animal-based drugs and more academic conceptions of Chinese medicine—that such drugs are indeed no more than a bad taste incidental to, and hence unreflective of, classical modes of health and healing. From one angle, the practice seems to embody what Elizabeth Hsu has described, in a slightly different context, as the rise of "an autonomous 'pharmacy' decoupled from the physician's clinical practice."[60] Yet state-institutionalized pharmacology in the early Communist period indeed paved the way to Golden Boten City and Golden Bear Private Limited, and, as we shall see, academic physicians and clinicians played a strong supporting role in this process, and still do today. Bear farms have their origins in Soviet-sponsored deer farms, the export of "luxury medicinals" like musk, and claims that injecting chicken blood into humans could cure a hundred diseases. They interweave references from ancient Chinese texts, Japanese laboratory reports, and North Korean experiments in veterinary surgery. They originate in the development of a drug-discovery and drug-making culture in the mid-twentieth century with strong political as well as economic imperatives—a culture that might have left medical animals behind as an artifact of a previous era, but instead chose to expand their exploitation. Animals in the twentieth century became the raw materials for a modern Chinese medicinal industry that presents an ecological, ethical, and public health challenge in the current generation. How and why that happened is the subject of the chapters that follow.