

8 Great Plans

Song Dynastic (960–1279) Institutions for Human and Veterinary Healthcare

Dagmar Schäfer and Han Yi

In 1317, looking back at the Southern Song reign, Ma Duanlin 馬端臨 (1245–1322) criticized the removal of responsibility for horses and cattle from the local and regional Herds Offices (*Qunmu si* 群牧司) to top-echelon administrative agencies, such as the Bureau of Military Affairs (*Sansheng shumiyuan* 三省樞密院).¹ This chapter examines this shift from the local level to the central state and discusses its impact on farming, managing and knowing large livestock during the Song. Using the example of animals, the chapter considers the relation between living organisms and statecraft, drawing attention to the role of the animal in literati thoughts about systems, function, infrastructure, organization and process.

Animals have played varying roles in Chinese historical approaches to knowledge and state systems.² During the Song dynasty, large livestock signified a challenge to political power, an artistic object, an economic and agricultural resource, environmental indicator and moral metaphor. Historians of military and political history have repeatedly blamed the Song reign's failure to unify all the constituent parts of its territory on its inability to breed oxen and horses or acquire them from elsewhere for its military campaigns and to cultivate new lands.³ Conversely, historians studying animal knowledge noted the huge impact of politics. In her overview of Chinese hippology, Ruth I. Meserve, for instance, emphasized the incredibly complex Song era systems, suggesting that, 'to really understand the place of the horse in Chinese civilization, one must turn to political administration'.⁴ In fact, horses feature particularly prominently in Song elite thought and political life. In this chapter, we suggest that the relation

¹ *Wenxian tongkao*, 160.1393.

² Birds and beasts constituted a special category in Chinese painting. For animal symbolism see Sung (2009); see Ptak (2010) for animals other than horses, and Guerrini (2015), who suggests that animals are standard historical actors.

³ See Lorge (2015), 257. ⁴ Meserve (1998), 278.

between power and knowledge reached much further into conceptual realms than such a positioning of power and knowledge in terms of administration and horses may suggest. Managing horses greatly affected human ideas about systems and knowledge: shaping when, why and how humans planned, and contributing to the developing notions of predictability, chance and change. By analysing veterinary care, and ideas about animal diseases and contagion, as well as when, why and how institutional structures were built, we examine the relation between practices and knowledge, in particular how thinking about animals impacted the thinking of scholar-officials and their ideas about social and state-institutional designs.

Veterinary Care and the Song State

In the tenth to thirteenth centuries the Northern and Southern Song strategically invested in large livestock farming, including cows (*huangniu* 黄牛), water buffaloes (*shuiniu* 水牛), horses (*ma* 馬), donkeys (*lü* 驢) and camels (*luotuo* 駱駝). Both governments regulated their use in agriculture and civil and military transport through administrative regulations, and built up a cross-regional institutional network to move and care for them. Historians of the horse trade such as H. G. Creel or Paul J. Smith have rightly revealed this investment in the form of institutionalization as part of political attempts to fulfil the growing demand for horses for military activities in a situation when the imperial state progressively lost control over suitable areas for livestock breeding (e.g. extensive Central Asian grasslands, Hexi corridor, north and south of the Tianshan Mountains, and along the Great Wall). The Liao and the Jin dynasties, testing Song rulers' legitimacy, competed fiercely for tributary exchange relationships with Central Asian states and tribes along the coastal regions – which the Song had traditionally relied upon to replenish their bloodstock.⁵ Song territory diminished even further in 1127 with the retreat south of the Yangtze following the Jurchen invasion, while the population continued to grow. In this situation, the Song had no option but to adapt cattle and horses to new climates and environments while at the same time facing dilemmas about human population and animal habitat management: less land had to be made available to provide for human and animal migrants alike.⁶

⁵ Deng (1997), 258, notes the importance of livestock in tributary exchange. On horse trade see Schafer (1963), esp. 59. Creel (1965) suggests that cultural and natural implications created significant difficulties for cattle and horse farming in coastal regions. Later studies such as Rossabi (1970), Beckwith (1991) and Smith (1991) confirm this view.

⁶ The move to the south led to changes in land usage; Jiang Tianjian (1995), 85. In due course, rearing methods such as forest pasture, fenced grazing and stable rearing were also widely applied. *Song huiyao jigao*, 7182 ('Bing 兵 24, 8'); Han Qi (1986), 267.



Figure 8.1 Herdsman on the back of an ox, *Mu niu tu juan* 牧牛圖卷, by Mao Yi 毛益 (12th century). Photo by Hu Chui 胡錘. Courtesy of the Palace Museum, Beijing.

As well as being used for military and civil purposes, horses and cows were also depicted as symbols of moral values, and indicators of social order in elite and folk culture, state ritual and the arts and crafts.⁷ In paintings, poetry or private writing (*biji* 筆記), Song rulers, spiritual leaders and intellectual elites praised large livestock as a source of energy and an emblem of pride and morality.⁸

Scholar-officials in charge of political and social life in the meritocratic Song state considered the formation of knowledge and socio-political structures (and in fact all structures) to be closely linked.⁹ In their service for the state, such scholars were furthermore often assigned multiple, highly diverse tasks. This caused them to consider how the things they wanted to understand interacted with other constituents of the entire system and to emphasize relationships and patterns. Although this cannot be discussed in detail here, we know that classics such as the *Liji* 禮記 (Book of Rites), the ‘Xici’ 繫辭 (Appendices) chapter of the *Yijing* 易經 (Book of Changes) and the ‘Hongfan’ 洪範 (Great Plan) chapter of the *Shangshu* 尚書 (Book of Documents) functioned like conceptual guides. They acted as types of Foucauldian *dispositifs* (devices) that explained how ideally to align institutional, physical and administrative mechanisms and knowledge structures to enhance and maintain power within society and the state.¹⁰ More specifically, scholar-officials justified their approach by retrieving diverse aspects of livestock – ritual procedure

⁷ McKnight and Liu (1999), 354, outline Song literati discourses on filial piety. Because oxen were important, auspicious sacrificial animals, their disease and death were seen as a threat to rulers. Sterckx (2002), 49, stresses that horses symbolized luck and oxen decay. See Spring (1988), 180, on horses and cattle in art and folk culture. See also Xie Chengxia (1985), 1–224; (1959), 1–284; *Zhongguo xumu yixuehui* (1992), 1–158. Sun Yang 孫陽, nicknamed Bole 伯樂, was an expert on horse physiognomy and treatment. See Harrist (1997), 136.

⁸ Jang (1992). For novelistic approaches see Idema (2006), esp. 64, 70. Such trends are even more prominent in Japan.

⁹ Allen (2015), 184. ¹⁰ Foucault (1980).

(*li* 禮), notions of customs and habits (*fengsu* 風俗), institutional structures (*guan-shu* 官署), notions of products (*wuchan* 物產) or more profanely benefits and costs (*liyi* 利益) – from previous dynasties such as the Han, Tang or, in the case of horses, also the Northern Qin.

Institutionally, the state distinguished between equine (horses and donkeys) husbandry for the military sector and bovine, ovine and all other animal farming for agricultural use. Horse breeding provided the standard for high-end *materia medica* and healthcare discussions (only specifying other animals when deemed necessary).¹¹ Trade and tax controls were imposed on horses as well as cattle, camels and sheep, even though we can assume that pigs and poultry may have habitually been treated along the same lines. Strategic state interventions were planned centrally, amassing extensive expertise in livestock care and epidemic control to create a comprehensive system of veterinary – and human – healthcare. Many rulings, though generic, were applicable to more than one animal and aimed at a healthy environment.

Epidemic Statistics

Just like the modern view, pre-modern state approaches to veterinary medicine were strongly influenced by the risk they believed humans faced from animal diseases. Historians have shown that notions about the origins of illness have had a substantial impact on the measures taken to prevent illness or deal with its consequences. For example, early medieval European Christians considered epidemics to be Acts of God – forms of moral punishment that had to be endured.¹² In contrast, eighteenth- and nineteenth-century science categorized epidemics as physical (bacterial, viral or parasitic) phenomena that were external to society and could be overcome with improved hygienic standards and new medicinal methods such as vaccinations.¹³

Song literati discussed veterinary diseases within complex frameworks of natural disasters and misguided human behaviour, debating how human ecology, moral weakness or lack of understanding of natural principles led people to act carelessly and resulted in epidemics and disasters along the lines of the

¹¹ Buell, May and Ramey (2010); Creel (1965), 648–9.

¹² Giovanni Boccaccio's (1313–75) *Decameron* [1935], 6 identifies different causes for plagues and disasters. He notes that many contemporaries in 1348 abandoned morality for pleasure, believing that humans could not stop plagues. See Stark (1996), chapter 2 on the influence of diseases on religious life.

¹³ European development of a smallpox vaccination features prominently in medical history, cf. Henderson (1997). See Smith and Petley (1992), 9–11, 211–16, for a historical overview of disasters and epidemics. They highlight Gilbert White (1945), who introduced the 'behavioural paradigm' – questioning genuine 'natural disasters', and re-framing them as man-made or technological instead.

Book of Changes or the *Book of Rites*.¹⁴ Illnesses could be prevented by moral behaviour and their spread prevented by appropriate human action, such as regional containment. As a matter of fact, twenty veterinary diseases are reported – i.e. one major veterinary epidemic every five to ten years – during the three centuries of Song rule.

This number seems high, but, in comparison to those of the later Ming era, Song records report more regional events.¹⁵ It thus seems as if state intervention during the Song did help to constrain veterinary diseases within regional limits, and the increase in reported epidemics is above all indicative of a functioning dynastic system of monitoring and prevention strategies rather than verifying an actual increase in epidemics.

The state system struggled to balance incentives for humans to pay attention to livestock diseases and measures to contain the misuse of such incentives. Prospective tax relief and financial aid for cases that threatened to spread across regions caused local officials occasionally to exaggerate cases. At the same time, misreporting or the failure to contain a reported epidemic was strictly penalized. Central scholar-officials also frequently exploited large-scale epidemics rhetorically in their political campaigns, accusing the state and emperor of neglecting their duties and acting immorally.

Epidemic: A Complex Medical-political Event

Song medicinal theories explained illnesses in animals, as in humans, as complex events, comprising ideas of flowing *qi* 氣 and *yin-yang* 陰陽 interchange as well as morality. Contemporary terminology emphasized the character of a disease, e.g. whether it was hot or cold, and evaluated the risk that each outbreak posed to individuals, society and the state.¹⁶ Pharmaceutical and spiritual healing practices were frequently combined. In state and elite records, which make up the majority of documents that have survived to the present day, an ‘epidemic’, however, mainly comprised a politically defined event requiring dynastic and literati attention, and not primarily a case defined on the basis of medical or biological considerations.

In statecraft and veterinary literature alike, Song scholars identified two main causes for the spread of animal epidemics: moving livestock to new regions and ill-informed treatment. The source of these insights was, quite

¹⁴ For an overview of intellectual trends during this period in relation to disasters and chaos, see Tucker and Berthrong (1998).

¹⁵ Wu Hualin (1999), 307 notes diverse approaches to natural disasters and the common people’s ability to cope with them.

¹⁶ This terminology was also used in human medicine – see Goldschmidt (2009), 75–7. Terms indicating infectious veterinary diseases are *cuo* 瘧, *ji* 疾 or *yi* 疫 (all translated as epidemic), as well as *li* 癘 (contagious illness), *wen* 瘟 (illness) and *shi* 時 (seasonal illness).

evidently, experience with long-distance transfers of horses and cattle for military, agricultural or other purposes, as well as the increasingly necessary relocation of breeding and agricultural activity from the northern steppe to southern subtropical climates. A report of 1169 on Hanyang claimed that ‘the [new] horses could not get accustomed to the local circumstances and hence sickened, contaminating others’.¹⁷ Scholars of this era, however, seem to have agreed that horses and cattle could in principle adapt to different seasonal changes in temperature or humidity by modifications in feeding and nurturing measures. Knowing how to treat the horse could mitigate any adverse effect of weather events. If the animals fell ill, scholars then moralized that it was because humans were careless, ignorant, egotistic or greedy. A common trope in memorials was that veterinary epidemics followed droughts, floods or unusual weather conditions such as unseasonal rainfall, or very warm or very cold weather.¹⁸ Secondary factors such as nutritional deficiencies or inadequate hygiene practices then prolonged the crises.

One early example of such reasoning relates to a cattle epidemic that broke out in the prefectures of Songzhou 宋州 (modern Shangqiu, Henan) and Bozhou 亳州 (modern Bozhou, Anhui), spreading to Jingxi 京西 circuit (*lu* 路) (modern Huaiyang, Henan), Chenzhou 陳州 (modern Huaiyang, Henan) and Yingzhou 潁州 (modern Fuyang, Henan) in the year 994. In all these districts, ‘more than half of the sick cattle died’.¹⁹ But, as the central record also notes, for the previous three years, local officials had already forewarned the central government that droughts had substantially reduced those regions’ yields.²⁰ In another case, during the early summer of 1009, almost all the cattle in Tanzhou 潭州 prefecture, Henan superior prefecture (*fu* 府), Xingzhou 邢州 prefecture and Shanxi 陝西 circuit died from disease (*niu yi* 牛疫) within eight months after a severe drought. More oxen died the next year in Hebei, Jingdong 京東 and Jingxi circuits. The epidemic peaked in 1014, and cases were still being reported in the eighth month of 1015.²¹ Both the historiographic records and involved individuals took a comprehensive, *longue durée* view, analysing the illness’s causes and dispersal, concluding that people had failed to notice the incipient problem or react to it properly.

This form of reasoning continued. In the 1180 case of an open epidemic in Nankang 南康 military prefecture (*jun* 軍) and Jiangnan 江南 Eastern circuit (*dong lu* 東) (modern Xingzi, Jiangxi) the scholar-official and philosopher Zhu

¹⁷ *Song hui yao jigao*, 7211 (‘Bing 25, 22’).

¹⁸ For how scholarly discourse started to relate the emperor’s morality and legitimacy of rulership to flood occurrences, see Hok-lam Chan (1985), chapter 2. As the Song capital Kaifeng was situated in the Yellow River’s alluvial plains, where four rivers met, floods constantly threatened the city, raising elite interest in flood control. See Lamouroux (1989); Han Maoli (1993), 11; Zhang Ling (2009).

¹⁹ *Song shi*, 173.4159. ²⁰ *Song shi*, 66.1439. ²¹ *Song shi*, 66.1440.

Xi 朱熹 (1130–1200) emphasized the discrepancy between people's knowledge and action: 'In the regions I am supervising a drought reduced last year's harvest. During last winter an earthquake occurred. In both cases I sent reports. After that not enough rain fell and the oxen again died from disease. Now it has finally started to rain, but I fear it is too late. The decline of the oxen can no longer be stopped.'²²

Even if oxen did not die in droughts or floods, catastrophes reduced fodder supplies, leading to nutritional deficiencies which again allowed diseases to spread.²³ The Vice Military Commander and Veterinary Doctor (*Shouyi fuzhi junshi* 獸醫副指揮使) Zhu Qiao 朱峭 (n.d.) explained the relationship between nutritional diet and illnesses in the case of horses as a question of rations: 'a horse needs seven *fen* 分 of grass and seven *sheng* 勝 of fodder in the form of cooked food daily. If the grass and fodder is raw, the horse needs seven *fen* of grass and six *sheng* of fodder. By the end of the year more of those fed with cooked fodder will have died.'²⁴ This assertion was based on causalities deduced by others. The Palace Attendant and eunuch (*neishi* 內侍) Yan Chenghan 閻承翰 (947–1014) had reached the same conclusion after supervising a delivery of horses from the eunuch Wang Shouwen 王守文 (n.d.): 'On the road the horses were fed with the usual quantity of cooked and raw fodder. On arrival, the horses were kept apart and fed the same quantity as during the journey. That is how we know that raw fodder is advantageous.' Yan also noticed that only the well-fed horses could resist illness: 'I fear six *sheng* of fodder is not enough. All horses should receive seven *fensheng* 分升.'²⁵ Another treatise claimed that horses would adjust to new locations more easily if they were fed native grass and recommended adding bran to their food, cautioning: 'Do not add too much water . . . Do not feed horses with old grass. It causes illness. During the winter months do not let them drink water. Take care that no sand or dung contaminates the water as this causes illnesses of the lungs, intestines or stomach. Ride them slowly at first and do not force them to make any sudden movements as this causes pneumatic illnesses.'²⁶

In his comprehensive *Nongshu* 農書 (Agricultural Treatise), written around 1149, the scholar and farmer Chen Fu 陳旉 (1076–1154) recommended controlling animal-rearing conditions, stating that all incidences of illness were *only* harmful if people reacted inappropriately to their circumstances:

²² *Zhuzi yulei* (vol. 11 of 'Hui'an xiansheng Zhuwengong wenji' 晦庵先生朱文公文集), 20.580–8 ('Gengzi yingzhao fengshi' 庚子應召風勢), 226.165–8.

²³ *Song shi*, 66.1440. Wang Yinglin (1223–96) refers to this incident in 'Xining taichang ciji zongyao' 熙寧太常祠祭總要在 his encyclopaedia *Yu hai* 玉海, 178.3276–7.

²⁴ *Song hui yao jigao*, 7182 ('Bing 24, 7'). Zhu Qiao edited (*ding* 定), rather than compiled, the Six Horses Policies.

²⁵ *Song hui yao jigao*, 7182 ('Bing 24, 12'). ²⁶ *Song hui yao jigao*, 7181 ('Bing 24, 5').

Cattle diseases are diverse. Some are caused by bloat inducing grass (*cao zhang* 草脹 i.e. flatulence).²⁷ Others are caused by ingesting diverse worms (*za chong* 雜蟲), as their poison contaminates the fodder, or because the vapours combine and cause constipation. One should understand the difference between cold and hot diseases. Medicine can be applied following human treatment but increase the dose and administer it as a potion. This will invariably help. If blood shows in the faeces and urine, it is hot damage. Use the medicine for blood passed in stools, increase the dose and administer it as a potion. If cold combines with a dry nose and a lack of breathing, apply powder recipes (*san yao* 散藥) dispersing internal heat. If [symptoms such as a] dry nose and lack of breathing combine with an accumulation of heat, medicine with a laxative function (*li yao* 利藥) has to be applied. Approach swelling by dredging the poison and by relieving and obtrusive measures. If you examine each principle in its appropriate conjunction, what illness would you continue to worry about?²⁸

Chen described diseases ranging from the most common to the most dangerous, classifying them within the traditional Chinese agrarian calendar of cyclical change.²⁹ He suggested that oxen should be acclimatized to new weather conditions by adjusting their diet and hygiene and explained that disease could only be contained by a combination of ritual and routine cleansing:³⁰ ‘Once an ox becomes sick the disease is transferred via the *qi*. All oxen will be infected. This is called an epidemic. A first countermeasure is to sacrifice to the heavens. If this is without effect, hope vanishes. Corpses, transported via villages, can spread the infection by their vapour.’³¹

About a century later, the literatus Zhou Mi 周密 (1232–1308) also used *qi* to describe how meat from donkeys or horses that had died of hunger could endanger humans and that one should not eat it.³²

All these observations were making the point that malpractice – ignorance about common causes or failure to act promptly – could prove fatal, and that only coordinated governmental action could stop an epidemic. In 1139 Emperor Gaozong (r. 1127–62) and the Minister of Rites (*Libu shangshu* 禮部尚書) Qin Hui 秦檜 (1091–1155) signed a peace treaty with the Jin dynasty, agreeing to pay taxes to the Jurchen Jin to remain in power. Following this disputed event, officials in charge of Jing lu 靖虜 circuit (in Hubei) reported

²⁷ *Cao zhang* refers to illnesses leading to swellings or ‘gatherings of *qi*’ in veins or organs. See *Huangdi neijing suwen*, 5.98.

²⁸ *Chen Fu nongshu jiaozhu*, vol. 2, chapter 2, 50.

²⁹ On spatio-temporal variety in Chinese medicine, see Hanson (2011), especially 12–14.

³⁰ In contrast to earlier concepts of disease that were independent from the body and rituals. See Kiple (1993), 5.

³¹ *Chen Fu nongshu jiaozhu*, vol. 2, chapter 2, 50.

³² *Guixin zashi*, 197 (Xuji, xia, ‘Sima sha ren’ 司馬傻人). His main point though was that any dead animal was dangerous: ‘Whenever one is skinning/cutting up a donkey or horse, one should also not come near. Its *qi* engulfs man and can produce illnesses. One cannot be cautious enough!’

that disease had wiped out 80 to 90 per cent of all cattle, then cross-infected the region's water deer, deer, boars, tigers and wolves.

The doctor Zhuang Chuo 莊綽 (c. 1079–1149) suggested in his *Jilei bian* 雞肋編 (Chicken Rib Chronicles) that the danger of the disease was shown in the fact that it had affected both immoral reptiles and loyal dogs.³³ The fact that the disease was oblivious to a creature's moral capacity, meant that the ruler in charge of watching the balance between Heaven and Earth had acted in an extremely immoral way.

That animals dying from diseases threatened not only the military power of the dynasty but also its inherent legitimacy can be seen as the primary reason that the Song government focused significant attention on veterinary advances from the beginning of its reign. Emperor Zhenzong (r. 997–1022) and Prime Minister (*canzhi zhengshi* 參知政事, rank 1) and household regent (*liushou* 留守) Wang Dan 王旦 (957–1017) had already enforced Xing Bing's 邢昺 (931–1010) theory that ranked the death of livestock as one of the 'Four Disasters' (*zaihuan* 災患) besides epidemic disease (*yi*), drought (*han* 旱) and flood (*shui* 水): 'Every year, one of these inevitably occurs, whether minor or severe.'³⁴

Institutional Structures: Farming

Zhang Xianyun, studying various forms of husbandry during the Song, shows that, as animal numbers increased, access to land declined and environments and climates changed, and private and state farms experimented with new methods of breeding, feeding and rearing. We do not know much about fields such as honey or raw silk production, that remained in private hands and were mostly pursued in the form of household agriculture.³⁵ State institutional veterinary care in fact concentrated on large livestock. It is interesting that the state separated units for cattle, horses, sheep and poultry. Each office employed its own managerial and veterinary staff, although local practitioners probably worked across the offices.

Medical institutions and staff structures for human and animal health were similar, but there are no signs of institutional cooperation. Most of the literature of this period focuses on pharmaceutical organization (irrespective of species, although it is clear that humans were the focus). Writings that focus on one animal species, as well as human pharmacopoeia, indicate cross-species usages

³³ *Jilei bian*, xia, 113.

³⁴ *Song shi*, 431.12799; *Xu Zizhi tongjian changbian*, 67.1507. Xing Bing held several posts, including Minister of Rites (rank 2a). He was a devoted scholar of the classics and had a place in the Hanlin 翰林 Academy.

³⁵ See Zhang Xianyun (2007), (2009), (2014). Song scholars compiled specialist tracts on different animals – Chapter 7 discusses their importance for Ming and Qing scholars.

of medication and treatment (animal–animal and human–animal), or occasionally include general remarks about their compatibility.

While the state reared various animals throughout the Song eras, the raising of horses and cattle constituted the origin of ideas and ideals about veterinary care over the entire empire. The central unit was the Herds Office, originally a stable for imperial horses, which soon developed into a model institution for veterinary care and the controlling centre for an empire-wide network designed to facilitate the cross-regional transport of horses and the breeding and rearing of cattle for agricultural and military purposes. In 980, it still consisted of a left and right courtyard and six stud farms (*liu fang jian* 六坊監) tending two thousand horses at a time. In 1000 the emperor ordered the office to take over ‘the administration of horse stables inside and outside the court. All institutions from the level of the Mounts Service (*Qiji yuan* 騎驥院, rank 7a) have to follow its orders.’³⁶ Its ‘assistants visit and inspect the prefectures annually to control bloodstock and husbandry conditions’.³⁷ This personnel was also put in charge of prosecuting offences by officials and veterinarians across the empire. After the first decades of the Song, when the Herds Office mainly dispatched personnel and medicine to tend to cases of disease, and sent memos, it succeeded in setting up local branches with resident staff.

Documents from the twelfth century show that the state was unwilling to relinquish its horses and cattle, despite its gradual loss of natural breeding areas in the northern territories. Instead, literati and state continuously promoted enhanced veterinary care and new breeding methods to regulate centrally its livestock and increase reproduction. They looked for precedents in laws inaugurated by the Tang,³⁸ although Tang breeding discourses had centred mainly around aesthetic considerations whereas Song officials, focused on military utility, had measured horses in terms of quantity since the first Song ruler had set up a quota system to increase numbers.³⁹

Breeding efforts aimed to produce horses that could travel long distances, adapt to different climates, and serve effectively in warfare.⁴⁰ Southern Song scholars increasingly discussed environmental conditions in the main regions

³⁶ *Xu Zizhi tongjian changbian*, 47.1025; *Song hui yao jigao*, 2885 (‘Zhiguan 職官 23, 5’).

³⁷ *Song shi*, 164.3895.

³⁸ Song veterinary arrangements were modelled after the Northern Qi Cattle and Sheep Department (*Niuyang si* 牛羊司) according to Ma Duanlin. See *Wenxian tongkao*, 160.1393; Zhang Xianyun (2007), especially 24. The Northern Song expanded this into an institution which supervised farming throughout the empire; *Song hui yao jigao*, 2857 (‘Zhiguan 21, 10’).

³⁹ According to Dou Yi’s 竇儀 (924–967 CE) ‘Muxu sishi ji ke buchong’ 牧畜死失及課不充 Song legal regulations mainly related to carelessness and delayed action. See *Song xing tong*, 231. Dou Yi was one of Emperor Taizu’s inner advisers who consolidated the Song state system. See Zhao Junping (2007), 668.

⁴⁰ Tang emperor Xuanzong (685–762 CE) personally controlled horse breeding. During this era the Office of Herds (*Dian mushu* 典牧署) was in charge of farming, especially sheep and cattle reared for the emperor’s food and court sacrifices. See Spring (1988), 10; Harrist (1997), 136.

where they wanted to relocate horses and cattle – Raozhou 饒州 prefecture, Jiangnan dong circuit (modern Poyang, Jiangxi), Lin'an 臨安 in Liangzhe circuit (modern Hangzhou, Zhejiang) and Yingcheng 應城 in Jinghu Northern circuit (modern Yingcheng in Hubei) – realizing that their hot and humid climates made them unsuitable for traditional northern farming and breeding methods or for cultivation as pasture.

Specialists in 'horse physiognomy' from this period referred to Tang literature but, instead of aesthetics, constantly stressed that in-breeding weakened horses and cattle and probably increased horses' susceptibility to sudden death from 'paralysing strokes of the pancreas' (*pi zhongfeng* 脾中風), an illness that was also widely diagnosed in humans.⁴¹ In any case, there was less access to purebreds, as Assistant Magistrate (*Zhubu* 主簿, rank 8b) Xue Xiang 薛向 (1016–81) complained in 1060: 'The state only receives ill horses. They are short, some less than four *chi* 尺 and two *cun* 寸, and their bones are weak. They are mixed breeds, but we cannot acquire purebreds. There are not enough horses for court and imperial use or for the delivery of imperial letters, that is the imperial postal system, and the supply of military horses is low.'⁴²

Some emperors actively participated in these debates, mainly by commenting on rearing methods. In an edict from 1071, Emperor Shenzong (r. 1067–85) and his central court criticized local officials because

they had jammed too many horses together in too small a space. The horses are rarely allowed to graze on open ground. Often they go hungry, as there is not enough grass. Even when they are allowed to enter a pasture they are tied to a stake and can neither move nor lie down nor rest comfortably.⁴³ Then they are allowed to graze at night, but when there is a thunderstorm they run and disappear, stampeding by the hundred, never to be seen again.

Xue Xiang advocated more investment in selective horse breeding, to achieve higher fertility, robustness and resistance to disease:

Fuzhou 福州 breeds are best. Horses raised around the middle Yellow River with its multiple branches are also good. Breeds from Huanzhou 環州 and Qingzhou 慶州 are second best, those from the Qin and Wei river regions have a huge skeleton, but their hooves are thin and light. Wenzhou 文州 and Yazhou 雅州 breeds are minor and hence only local troops and postal services use them. Horses from Khitan have a bad skeleton. The horses bred in Hebei are now considered native (*ben qun* 本群) as they have adapted to the region and are robust. Horses are also bred on the islands of Quanzhou 泉州,

⁴¹ See *Ren zhai zhizhi fanglun*, 42. Such 'paralysing strokes' could hit any organ.

⁴² *Song hui yao jigao*, 7145 ('Bing 22, 4'). Xue also helped finance hydraulic projects and supported Shen Kuo's 沈括 (1031–95) attempts to drain swamps in northwestern Hebei for agricultural use. Shen Kuo proposed protecting cattle and horses from mosquito bites by covering them with mud. See Zhang Ling (2011), 33, 38.

⁴³ Horses do not usually lie down to rest. The author was probably stressing how unsuitable the method was.

Fuzhou and Xinghua 興華 military prefecture. They are all small and cannot carry armour. The native militia and postal service in Jiangzhe 江浙 use them.⁴⁴

His opinion that horses from Khitan were lower quality was probably clouded by political ideals, since Song rulers had been challenged by people there. Quantity was just as important as quality, so the government ordered officials to:

herd together female and male horses, camels, cattle, donkeys, sheep and goats during the third month each year, so that the horses, camels (and other) stallions can approach the mares in heat. Those which are supposed to conceive (*shousi* 收飼) shall be allowed to receive them until the winter. If, by that time, no [obvious] conception has taken place, investigate whether they have conceived, and if they have not, the law forbids punishment. (Commentary (*zhuyun* 注云)⁴⁵: if the cattle lose their offspring after having been freed to roam (*youmu* 遊牝), prosecute the person responsible.)⁴⁶

The state imposed annual reproduction quotas for horses, camels and cattle of seventy offspring per hundred animals and eighty per hundred for sheep and goats.⁴⁷ Yet Zhang Xianyun shows that these quotas were rarely filled; the maximum achieved was 60 per cent. In 1085, for example, the average birth rate was fourteen colts per hundred studs and, during the Qiandao reign (1165–73) of Emperor Xiaozong (r. 1162–89), regions such as Yingzhou 鄧州 and Ezhou 鄂州 prefectures recorded just four or six births per hundred studs.⁴⁸ This continual shortage of equine livestock impacted agriculture and the military, trade and transportation. Thus, any additional loss of horses through disease represented a real threat to the state's survival, possibly leading to crop shortfalls, famine, social unrest, weakened military strength and slower communications. Even so, horses continued to be kept in overcrowded herds.

In contrast, cattle farming was a much more successful big business. By the Northern Song era, districts like Shanxi, Hebei and Xihe 熙河 were centres of ox husbandry. During the Southern Song, Zhejiang, Fujian, Huainan,⁴⁹

⁴⁴ *Song hui yao jigao*, 7180 ('Bing 24, 3').

⁴⁵ The remark is added in smaller script which indicates it is a comment. The source or author is unclear.

⁴⁶ *Song xing tong*, 232.

⁴⁷ Zhang Xianyun (2007), 48. Tang numbers are taken from Yue Shi's 樂史 (930–1007) survey *Taiping huanyu ji* 太平寰宇記 (Universal Geography of the Taiping Era [976–983]), 151.1b–2a (vol. 47, 423). This text was compiled in the Song, but claims to use Tang data.

⁴⁸ *Song hui yao jigao*, 7214–15 ('Bing 25, 28–31').

⁴⁹ Meng Yuanlao 孟元老 (fl. c. twelfth century) reports that even the small village of Zhengzhuang produced 70,000 to 80,000 oxen annually. See *Dong jing menghua lu*, 47. Wen Yanbo 文彥博 (1006–97) was fascinated by this region's productive farming. See *Lu gong wenji*, 712. See also Han Qi (1986), 267; *Xu Zizhi tongjian changbian*, 489.11607.

Liangzhe, Fujian, Guangnan and Sichuan took over.⁵⁰ Records indicate that, when disease broke out in a district such as Changzhou, the state could easily buy two thousand replacement cattle from Fujian and Zhedong provinces.⁵¹ Private traders purchased herds of thousands at a single market, and smuggled them almost unimpeded across the country to avoid sales taxes. Local customers at the Zhengzhuang 鄭莊 ferry crossing estimated that 70,000 to 80,000 cattle were illegally transported over the prefecture border every year.⁵² These large herds were, at least partly, a side effect of the state's intervention, because it leased out cattle herds, so the number of herds grew continuously.⁵³ Official state historiography notes an imbalance in regions such as Ganzhou 贛州 and Jizhou 吉州, where 'farmers in the slack seasons mutually agreed to travel to the south to trade oxen. This was called "winter work" (*zuo dong* 作冬).'⁵⁴

The government restricted the number of animals that it was permitted to keep together, aiming to keep herds large enough for effective reproduction but small enough to avoid losses through epidemics. The law defined a number of 120 cattle as an ideal herd, which went up to 630 for smaller animals such as sheep or goats.⁵⁵ Convoys (*gangma* 綱馬) were generally restricted to 200 horses (*pi* 匹) in the Northern Song (compared to 900 previously), which was reduced to a hundred in the early Southern Song and fifty after 1164.⁵⁶ Any animal movement had to be preceded by a health examination, which reduced financial risk by removing any ill or weak livestock before the long, arduous and expensive journeys from the southern and Sichuan regions to the capital.⁵⁷ The Herds Office was ordered to limit its overall stock to fewer than two thousand horses.⁵⁸

Institutionalized Prevention

The Song state controlled animal epidemics through five mechanisms: (1) They institutionalized an early warning system, obliging all officials to report epidemics, and (2) centralized medical treatment and bloodstock control. (3) Care-taking stations (hospitals) were set up, veterinarians appointed and medication allocated to enhance medical care throughout the country, and the state promoted the publication of prescriptions for self-treatment. (4) Laws on

⁵⁰ Lianghu and Jianghuai mainly produced cattle for self-sufficiency until the Southern Song. See *Song hui yao jigao*, 6034 ('Shihuo 食貨 63, 96') and 6065 ('Shihuo 63, 140').

⁵¹ *Song hui yao jigao*, 6034 ('Shihuo 63, 96').

⁵² *Jianyan yilai xian yan yaolu*, 164.2681 (Shaoxing 23, month 3, *guichou*).

⁵³ Zhang Xianyun (2007), 115, states this is also true for other animals. For silkworms, see Bray (1984), 76; and Kuhn (1988).

⁵⁴ *Song hui yao jigao*, 5110 ('Shihuo 18, 18'). ⁵⁵ *Zhiguan fenji*, 19.451.

⁵⁶ Han Yi (2015), 322–5. ⁵⁷ *Song hui yao jigao*, 7179 ('Bing 24, 1').

⁵⁸ *Song hui yao jigao*, 7188 ('Bing 24, 20').

the sale, trade and transportation of oxen and horses were reformed. (5) Officials propagated technical solutions to substitute ox or horse labour, exempted taxes and fees, or gave financial support to reduce the impact of losses. This system was designed to respond rapidly to outbreaks, with government personnel analysing the source of epidemics and initiating measures to limit their damage. Meanwhile, the unit supervising bloodstock and breeding worked towards long-term improvement, using selective reproduction to increase resistance to infection.

The Song built veterinary institutions step-by-step and seemingly driven by a growing demand (or awareness thereof), similar to how, one after another, it installed institutions in the human medical sector.⁵⁹ Structures were founded in the early days of dynastic rule, conceptualized during the Qingli 慶歷 reforms of the 1040s and finalized towards the end of Emperor Shenzong's reign. The Song state's approach to veterinary medicine after 1076 must be viewed in the context of the economic and socio-political transformation initiated by Grand Councillor Wang Anshi 王安石 (1021–86).⁶⁰ The Northern Song state underwent continuous reform and refinement of institutional structures, with scholars urging that the veterinary system should be expanded throughout the empire to secure horse and cattle supplies. There was an upsurge of natural disasters and epidemics following the retreat to the south, including cases that contemporary actors considered unusual, unexpected or unprecedented.⁶¹ As veterinary epidemics – like natural disasters – became a signifier of the dynastic state's moral ability to rule, scholars responded with more control and monitoring. Senior ministers set staff to animal ratios to deal with horses and cattle. As knowing livestock hence became crucial to knowing how to rule society and state, politicians took charge of livestock management and made sure expertise was generated and available for animal health.

Staff: Animal Experts and Expertise in Animal Care

As in all other bureaucratic units, senior Herds Office staff were literati-officials who had passed the civil service examination. For most of the Song, the Vice Director of the Ministry of War (*Bingbu shilang* 兵部侍郎, rank 3b) or the Vice Commissioner of the Bureau of Military Affairs (*Shumi fushi* 樞密副使, rank 6a) headed the Herds Office officially. Records assign various levels of

⁵⁹ Goldschmidt (2009), 14–20, 42–5, stresses that scholarly interests helped implant medicinal knowledge and public hygiene into broader common culture. Some, like Fan Zhongyan 范仲淹 (989–1052), Su Shi 蘇軾 (1037–1101) and Shen Kuo also worked to cure veterinary epidemics.

⁶⁰ Goldschmidt (2009), 47–8. The Pharmacy Service for Humans was established in 1076.

⁶¹ Kang Hong (1994), 125, counted 1,279 centrally acknowledged natural disasters, including 40 plagues, 465 floods, 383 droughts and 108 plagues of locusts.

responsibility and expertise to different staff. Grooms carried out the daily tasks. Concurrent to the continuous move towards the south, the state expanded its web of veterinary expertise over its territory. At all times, generalists and politicians controlled the state structures of animal care, keeping an eye on the wider view.

Grooms needed, as Emperor Zhenzong decreed in 1003, to be well trained and experienced. Because stable work was physically demanding, only ‘healthy men aged around twenty, strong and muscular’ with an interest in farming should be appointed,⁶² according to guidelines published in 1011. The focus of politics, however, lay on veterinary doctors which the state required in increasing numbers. Recruiting from candidates for the civil service exam, such veterinary doctors were trained in a unique unit of the Imperial Herds Office, the Inner and Outer Service for Skinning Horses (*Nei wai baoma wu* 內外剝馬務, *pibao suo* 皮包所).

Initially located in the Jiaqing 嘉慶 city workshop (*fang* 坊), the Service for Skinning Horses was first run by the Court of the Imperial Stud (*Taipu si* 太僕寺). With its relocation to the Yanxi 延禧 city workshop (both located in the capital Kaifeng), from 1072 the Bureau of Equipment (*Jiabu* 駕部) took over supervision, before in 1127 the Bureau of Military Affairs (*Shumi yuan* 樞密院) was put in charge. After the retreat in 1167, the Southern Song reconfigured the Service for Skinning into a court institution in its new capital Hangzhou. Politics caused administrative relocations: geographic relocation also reflects the state’s ambiguous relation to an institution that produced important resources, allowed its elite to learn important skills and yet was in fact a filthy, stinking place of work.

The staff, comprising the directorate’s craftsmen (*gongjiang* 工匠), palace auxiliary officials (*qin cong guan* 親從官) and officials from the Imperial Coachmen and Guardsmen (*Qimazhi junshi* 騎馬直軍士), made sure that the skins of horses, oxen, camel and donkeys (and probably also pigs and other animals) were turned into leather, and sinews and bones used for bows and arrows, armaments and utensils. This same staff then ‘recomposed the bones’ (*xiang bu suojiào* 相補所角) – the expression suggests from many bodies – to be ‘studied by the herding officials’ (*muguan xuexi* 牧官學習). Office regulations explicitly required investigators to report meticulously on all these procedures, including providing diagrams or illustrations (*tu* 圖) ‘for later inspection’ (*yigong biyong* 以供備用, literally: ‘to be kept in reserve’).⁶³ These dissections were a major source of the detailed horse physiognomy diagrams preserved from the Song era.

⁶² *Song hui yao jigao*, 2857 (‘Zhiguan 21, 10’).

⁶³ *Song hui yao jigao*, 2514–15 (‘Zhiguan 6, 35–8’).

Corpses of animals that had died from disease or old age were delivered to the Knackery as well, to help its staff improve their general understanding of animal physiognomy, illnesses and their effects. Aware of the health risks of infected meat, the officers also decided whether meat should be disposed of, or fed to the eagles and hounds of the Five Corrals (*Wu fang* 五坊) kept for hunting.

The Song government used these officially ordered scholarly investigations to identify suitable candidates for appointment in the veterinary sector, illustrating that the field was institutionalized and, in due course, also professionalized. Successful candidates had to complete specialized training and then pass a state-regulated examination in order to obtain an official rank and position.⁶⁴ Sources variously use the terms *shouyi* 獸醫 and *yishou* 醫獸, assigning ‘veterinarians’ the tasks of treating livestock, preparing medication and devising new remedies and treatment methods.⁶⁵ Veterinarians were appointed permanently to horse stables, breeding stations and military units during both Song dynasties.⁶⁶

Every three years, the administration evaluated directors’ and veterinarians’ work and determined their salaries and benefits by comparing the number of ill and healthy horses. Hence, the horses’ health, which was a source of pride, energy and strength for the empire, relied upon an individual system of reward and punishment, like that used for astronomical officials.⁶⁷ The guidelines also specified procedures:

The Herds Office must ensure that the veterinarians separate horses when they are ill into two courtyards, with one group consisting of infected and the other of healthy horses, registered and marked (*jihao* 記號) accordingly. The Herds Office has to verify this grouping and then hand over the ill horses to the breeding station for treatment. If required, recruit additional personnel from the stud farms. The veterinarians must scrutinize the deaths. The breeding station has to verify this number and reward or punish accordingly. At the end of each year the number of horse deaths and ill horses has to be compared. Evaluations of the staff’s achievements occur bi-annually. We require the initial number of horse deaths to be reduced by one third. Hand over 50 *guan* 貫 (strings of cash) as reward; where the losses exceed 30%, pay 16 *guan*. If losses go up to 40 or 50% no payment is given. Prosecute a loss above 60% by fining a month’s salary; for losses of 70%, charge one quarter of an annual salary. Losses of around 80% have to be taken to court. Both stud farms should only feed good breeds. The number of horses who fall ill and have to be disposed of is only counted once a year. If it is below the average of other stud farms, convey rewards. In cases where it is higher, prosecute the officials according to their rank.⁶⁸

Requests for mobile veterinarians increased in the Southern Song. In 1133 Gaozong commanded that every horse sale station should have a veterinary

⁶⁴ *Zhiguan fenji*, 24.513. ⁶⁵ *Zhiguan fenji*, 24.530.

⁶⁶ *Song hui yao jigao*, 7039 (‘Bing 18, 8’). ⁶⁷ Sun Xiaochun and Han Yi (2015).

⁶⁸ *Song hui yao jigao*, 7125 (‘Bing 21, 2’).

specialist, insisting that a delegation of officials should accompany horse transfers:

For each delivery of 100 horses appoint two officials for supervision. An official of a higher rank (*jiangxiao* 將校), two officials of a lower rank (*jieji* 節級), fifty military soldiers or main soldiers (*xiangjun* 廂軍 or *jinjun* 禁軍) have to be employed to guide the horses. One veterinarian and a secretary (*jundian* 軍典) is allowed. The veterinarian is allowed to hire help on the way.⁶⁹

Thus, staff became a substantial cost factor in the Song horse trade.⁷⁰ There were not always sufficient veterinarians available to accompany every journey and manage local stables.⁷¹ In certain cases, the court dispatched additional personnel to afflicted regions to assist and report back, equipping them with the necessary tools and ordering them to ensure standards of hygiene and to distribute medication, state-financed books and medicinal treatises.⁷²

Around 1043, when Fan Zhongyan 范仲淹 (989–1052) and Ouyang Xiu 歐陽修 (1007–72) tried to streamline bureaucracy, and in the Wang Anshi era, at the end of the eleventh century, various parties utilized veterinary medicine in political discourse. For political reasons, officials stopped reporting epidemics. Experts objected in vain to the government that equine managers should not be reassigned every three years, because this was often too fast for them to gain a thorough understanding of the sector or bring about any lasting change. When Shenzong installed a regulatory system of retribution, ‘Mazheng guanli keji shouzhaio’ 馬政官吏課績手詔 (Edicts on the Assessment of Achievements in Horse Administration) in 1068, he noted that officials in the capital often held superfluous posts, yet there was a lack of veterinarians in the countryside.⁷³ This was the same for human doctors, who would rather remain unemployed in the capital than accept a role in a prefecture (in 1122 Huizong (r. 1100–26) fired all redundant doctors).

Some inconsistencies in the regulations of the responsibilities and duties in veterinary care impeded the control of epidemics. Since salaries depended on the number of healthy livestock an institution produced at the end of each year, military and civil servants were afraid to do anything that might affect their quota,⁷⁴ such as looking after ill horses awaiting delivery to the capital. Fearing the lack of compensation for a dead animal, many sold their horses before an

⁶⁹ *Song hui yao jigao*, 7195 (‘Bing 25, 33–4’).

⁷⁰ *Song hui yao jigao*, 7214–15 (‘Bing 25, 28–31’).

⁷¹ During the Southern Song, most horses were bred in Chuan 川 (modern Sichuan), Qin 秦 (modern Gansu and Qinghai) and Guang 廣 (modern Guangxi and Yunnan). The distance from Sichuan to the Southern Song capital Lin’an was about 1,900 km. They probably travelled 15 to 20 km per day, carrying water for the animals.

⁷² *Song shi*, 173.4159. ⁷³ *Song shi*, 198.4939.

⁷⁴ *Song hui yao jigao*, 3327 (‘Zhiguan 43, 107’); 3331 (‘Zhiguan 43, 116’); 7219 (‘Bing 25, 38–9’); 7132 (‘Bing 21, 15’).

incipient illness could be detected.⁷⁵ In 1206 the state, in response to such practices, ordered experts to be dispatched to investigate the horses' health along every step of their journey.⁷⁶

Although the Herds Office was considered vital for military affairs, its own leader was not highly ranked, rather achieving authority through the assigned directors' other appointments. The principle of multiple appointments applied by the Song meant that major protagonists such as Chen Yaosou 陳堯叟 (961–1017), Zhao Anren 趙安仁 (958–1018), Xue Ying 薛映 (951–1024), Bao Zheng 包拯 (999–1062), Ouyang Xiu, Wu Yuncheng 武允成 (fl. 918), Wang Anshi and Sima Guang 司馬光 (1019–86) presided over the institution of equine husbandry, and thus shaped the development of veterinary medicine.⁷⁷ Many of these men, though highly educated polymaths, had humble origins and we can thus assume that they may have experienced agriculture as part of their daily life, even if they may not have cultivated the lands themselves. So this field was led by engaged, informed generalists who were first and foremost concerned about peace and well-being and thus looked at animal populations as part of larger considerations on human well-being and the state's health.

Considering the combination of tasks carried out by one person and the fact that Song agricultural tracts repeatedly compare the efficiency of human and animal labour for land cultivation or transportation, a question arises about the relation between concepts of human and animal bodies. Were both fields influencing each other, or did one occasionally take the lead? What was considered the same or different, and in what ways? Sources about two institutions – the Knackery and the Imperial Pharmacy for livestock – suggest that the volume of animals spurred the professionalization of veterinary care, occasionally pre-empting conceptual approaches in human medicine.

Remedies for Invalids

Noting that human negligence caused many illnesses, Chen Fu indicates that the literati assumed that bodily processes worked along similar principles in both humans and animals, advising that 'medicine can be applied following human treatment but increase the dose and administer it as a potion'.⁷⁸ As veterinary prescriptions coincided with human medical care, no specialist

⁷⁵ *Song hui yao jigao*, 7211 ('Bing 25, 22').

⁷⁶ *Song hui yao jigao*, 7172 ('Bing 23, 25'). Bol (1992), 73 notes the strong ties of loyalty between local officials and the central state, which kept central state officials well informed.

⁷⁷ *Wenguo Wenzheng Sima gong wenji*, 6.127; *Yiwen leiju*, 57.818; *Wu lei xiang gan zhi*, 52.1536. See Schäfer (1995), 79, on Song multiple appointments.

⁷⁸ *Chen Fu nongshu jiaozhu*, vol. 2, chapter 2, 50. Quoted in full on 230.

veterinary pharmaceutical literature emerged. Yet, according to the records, veterinary care took the chronological lead over human medicine in its practical application and institutionalization.

Emperor Taizong (r. 976–997) established a specialist veterinary institution for collecting, preparing and storing herbs – the Magazine for Medicines and Honey (*Yaomi ku* 藥蜜庫)⁷⁹ – which used prescribed formulae much earlier than the Pharmacy Service (*heji ju* 和劑局), established in 1076.⁸⁰ The sources are inconclusive about distribution infrastructures, yet Yaozhou 耀州 was clearly a major supplier for both horse and human medicine. The veterinary pharmacy had fewer sections than its human counterpart, which included a pharmacy and factory. Nonetheless, the mass production and distribution of drugs and remedies was first institutionally anchored within veterinary care.⁸¹

The Magazine was low status and Emperor Zhenzong used appointments there for probation or punishment: ‘If they then behave well and do not run up debts, they can return to their original post.’⁸² Despite Zhenzong’s low esteem for its directors, the office was allocated substantial finances and considered an important state duty. Institutionally and conceptually, the Northern Song thus established a solid basis for monitoring and preventing epidemics.

Officials in the Storehouse had to control the quality of the deliveries, weighing all incoming and outgoing ingredients and ensuring that containers were correctly sealed and opened to prevent contamination. Standardized prescriptions were distributed throughout institutions and to state-employed veterinarians, who adjusted the medicine to suit local needs.⁸³ In 1011 the Herds Office Director-in-Chief (*qunmu dujian* 群牧都監, rank 9) Zhang Jineng 張繼能 (957–1021) reported that:

the horse stables to the left and right, the six stables and the stud farms and others constantly use medicine. They mainly follow the ten guiding ways of the *Yima yaofang* 醫馬藥方 (Recipe Collection for the Medicinal Treatment of Horses) compiled by the Veterinarian and Military Commander Zhu Qiao 朱峭 (fl. c. eleventh century). Two of these methods (*dao* 道) are used continuously. They are concocted and put in storage. The collection is constantly refilled. The eight other methods are not used very often and they are produced upon request as assessed by the stables and the studs and then stored.

⁷⁹ The literal translation here illustrates that the institution may have had storage functions for multiple purposes. Charles Hucker (1985), 577 (entry 7899), uses the generic ‘Medical Storehouse’, staffed by non-official experts.

⁸⁰ The *Song hui yao jigao*, 5705 (‘Shihuo 52, 13’) suggests the office was named after the Tang institution for horse medicine, the Xuanyi 宣義 workshop, which probably also treated the emperors’ pet horses.

⁸¹ Goldschmidt (2009), 126–8. ⁸² *Song hui yao jigao*, 5705 (‘Shihuo 52, 13’).

⁸³ See *Zhiguan fenji*, 19.458 (‘Muyang shang xia jian’ 牧羊上下鑿); *Song hui yao jigao*, 7125 (‘Bing 21, 2’). A Jingde reign (1007) edict suggests it mainly handled military issues. See *Song hui yao jigao*, 5705 (‘Shihuo 52, 13’).

I suggest that these medicines only be prepared upon request . . . The 68,889 medications noted in the original calculation could be reduced by 70%. The reduction was approved.⁸⁴

Chronologically, veterinary care promoted the use of prescriptive formulae and recipes before such methods were introduced to Song human healthcare.

Conclusion

Central state concerns shaped the development of cattle and horse farming, advancing a quantitative increase and a qualitative reorientation. It combined monitoring strategies with educational campaigns, which ultimately evolved into an infrastructure for pharmaceutical, medicinal and hygiene practices in the veterinary sector. State structures for both veterinary and human medicine had elaborate bureaucracies and some similarities in their medicinal concepts and approaches.⁸⁵ Although written records suggest that human medicine provided the theoretical template, practical implementation of methods such as prescribed medicines chronologically first occurred in the treatment of animals.⁸⁶ Further research is needed to ascertain how views on animal care relate to the Song's substantial changes in medical methods and healthcare institutionalization.

Tang dynasty literature often viewed horses as exceptional and exotic, providing information about breeds, reproduction and specialist treatments.⁸⁷ In contrast, Song actors understood veterinary care within a wider context, acknowledging horses as an integral part of the entirety of existence, having manifold functions for society and state. Complex policies were implemented to ensure animal health: trade, ritual, and moral behaviour were all discussed, alongside nutrition and physiognomy. Literature on veterinary topics increasingly delineated general principles of veterinary care and medicine within its complex relationships to other factors such as climate, human behaviour and resource management. Sources also illustrate how Song scholars placed horses at one end of a continuum in which all diseases, treatment and reproduction followed the same rules. Guidelines for good farming practice were applied to horses and other livestock, such as sheep or goats, as well as humans.

For the scholar-literati of the Song, a well-organized institutional framework was a key element of the ensuing policies which were intended to prevent and

⁸⁴ *Song hui yao jigao*, 7182 ('Bing 24, 12').

⁸⁵ Buell et al. (2010), 33 note the increasing application of human medical theory to animals. See Hanson (2011) on epidemics more generally; Goldschmidt (2009) and Yuan Dongmei (2008), 83–6 on Song human medicine.

⁸⁶ Goldschmidt (2009) suggests prescribed medicine was a Song innovation. Buell et al. (2010), 35 observe that most theory was about humans, and was referred to for animals.

⁸⁷ Goodrich (1984), 295–6.

control epidemics, train veterinarians and provide standardized remedies, medicines and hygiene practices. This was supported by a political system of incentives, rewards and punishments which was inspired by classics such as the *Book of Rites* and the *Book of Changes*. At the same time, scholar-officials at court closely scrutinized livestock to develop further strategies of intervention and care. An elaborate network of veterinary doctors and reference materials on animals and their health emerged.

Although uncertainties about procedures arose in veterinary care as a consequence of factional disturbances between conservative and liberal circles during the Qingli reforms, the critique of Ma Duanlin about a centralized veterinary care system cannot be confirmed. As a matter of fact, the Southern Song stripped the Herds Office and directorates of their duties and eventually abolished them. The Southern Song then continued to invest in horse and cattle care and in animal disease control and prevention throughout this period.⁸⁸ The growing expertise of veterinary caretakers in military posts meant that animals were taken care of across various areas and by diverse means. How this relates to the disappearance of livestock from genres such as the *nongshu*, shifting attention to species in statecraft or their uses in daily life, is worth further research.

⁸⁸ *Wenxian tongkao*, 160.1393.