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„A Study of Central Eurasian Innovations in Warring States China and their Impact on War and Domination“

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Christine Hofmann, Bakk. phil.

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Betreuerin:	o. Univ.-Prof. Dr. Susanne WEIGELIN-SCHWIEDRZIK

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Introduction

This thesis examines the historical significance of China's early interactions with its neighbors from the steppes. More specifically, it will concentrate on a timeframe around the late Eastern Zhou Period, in particular the Warring States Period, and try to throw some light on the nature of the relationship between the Chinese on the Central Plains and the Central Eurasian steppe dwellers to their north and west and the effects this relationship would have been able to have on the political balance, distribution of power, and outcome of struggles during this period. To this end, it will look at some innovations that entered China during this period, to show that they were adopted from the pastoralist peoples of the adjoining Central Eurasian steppes, and thereby illustrate the intimate nature of the interactions between agricultural China and the steppe pastoralists.

The history of China's interactions with its steppe neighbors is one that reaches back to the very beginning of Chinese civilization. When the first cultures arose on the Central Plains of what today constitutes China, centering on the two great rivers, other cultures developed not far to the north and west;[1] in the beginning, they were not yet separated by as sharp a divide as that between steppe and farmland, between "China" and the "outside", which would become distinct only much later; yet the difference in ecological environments already dictated disparate ways of subsistence and different material cultures evolved as a result. From as early as the Shang dynasty, archaeological remains clearly indicate the presence of pastoral cultures distinct from the cultures of the Central Plains (DiCosmo 1999: 887).

Despite the fact that the budding Chinese civilization always had many other cultures in relative vicinity in the steppes and valleys to the north and west, its relationship to and interactions with these peoples have either been ignored or only been touched upon in Sinological scholarship. The unspoken, underlying assumption seems to be that Chinese history evolved in isolation from the western part of the continent and that the rise of civilization in China and all the cultural, societal, and technological developments associated with it were basically self-fueled and self-contained. Connections with the West are only acknowledged to have

[1] See DiCosmo 1999:897 ff. for a detailed description of the cultures present at the time

started from the time of the official opening of the Silk Road around 130 BC, when emperor 武帝 Wǔ-dì of the Han dynasty sent an emissary into the West on a quest for Heavenly Horses; an event which marked the beginning of China's endeavors for direct political and economic relations with states and peoples to its west (Kelekna 2009a: 146-8).

Part of the reason why the relationship of the Chinese with peoples on the "outside" is underrepresented in scholarship is that these peoples were usually not seen as being able to contribute anything of value to the great Chinese civilization. Most of them did not keep written historical records of their own, and so their history has long been limited to what contemporary Chinese historians considered noteworthy; their characterization is therefore correspondingly one-dimensional, and its tone often conditioned by the nature of political interactions at the time. Until modern times the role of the Central Eurasians was often reduced to the one of the villain, the intruder, the raider, encroaching on and feeding upon the material and intellectual wealth of the great agricultural empires on the periphery (e.g. Sinor 1978; Barfield 2001: 235).

However, recent scholarship has started to emphasize explicitly what has actually been known for a long time: the attacks and raids of Central Eurasians on peripheral nations like China only represented a tiny facet of their relationship with them. History and archaeology both clearly show that China was never isolated; quite to the contrary, it entertained friendly trade relationships with peoples to the north and west which, in their frequency as well as importance, far outshone the more violent border incidences – and which started long before the official opening of what we now call the "Silk Road".

The term "Silk Road" itself is misleading; the concept has been subject to some misconceptions which nonetheless have become common knowledge. What it denotes never was a road; neither was it just a network of trade routes, as it has often been amended. It was a vast and very complex trade system that spanned the whole of Central Eurasia from one end of the continent to the other, and as such represented the Central Eurasian economy as a unity (Beckwith 2009: xx). Many different kinds of products were indeed transported via this Silk Road economy; however, they rarely traversed the entire distance to be directly traded from one peripheral empire to another. Instead, they were traded multiple times along the way, increasing in value the farther they went and enriching the various peoples and states through which they passed. The first tentative beginnings of this system are to be found mil-

lennia before the first attempts by the Han court to set up direct trade relations; they are as old as the first interactions between Chinese and "foreign" peoples, or indeed, interactions between different peoples in general. Parts of this system were in place as early as 2000 BC; archaeological excavations have shown that practically all the nephrite jade in pre-imperial China was from Khotan, several thousand kilometers away in the western part of the Tarim basin (Benjamin 2007: 34). Similar to this early "Jade Road", a "Lapis Lazuli Road" transported another precious mineral between Sogdiana and areas farther west (Kuzmina and Mair: 4).

The importance of the people that inhabited the steppes for these interactions and exchanges has been widely acknowledged in scholarship and been emphasized especially in recent times (e.g. DiCosmo 1999, 2004; Beckwith 2009). While largely pastoralist communities in China's vicinity are attested from at least the Shang dynasty, the 1st millennium BC saw the advent of the horse-mounted, fully nomadic form of pastoralism and its subsequent spread throughout the Eurasian steppes and the emergence of highly mobile communities. Equestrian nomads roamed the territories on the Chinese periphery from at least the 8th century BC; from the same time, trade contacts with the west were in place, albeit indirect, and became vastly more intense (Kuzmina 1998: 64). The nomads' form of subsistence ensured not only their mobility, but also that they would engage in trade with settled populations at the verges of their territories; in this, they were not only the ones that caused the remarkable connectedness of the Central Eurasian trade economy and precipitated the birth of the "Silk Road" economy; for a very long time, their migratory and mercantile activities were the only factor that sustained it.

It is clear that the nomads were vital for this system of exchanges; they allowed material goods to be exchanged between peoples and civilizations before these even knew about each other's existence, let alone engaged in direct trade. This not only ensured that China received foreign goods, it also opened up a market for their own products (DiCosmo 1999: 885). But material items were not the only things that were carried by the nomads; they also helped to transport livestock, technologies, diseases, and ideas or concepts across the continent (Litvinsky and Zhang: 486). This "mechanism" of nomadic trade ultimately was the reason for the unparalleled cultural and technological unity of the Eurasian continent; some go

so far as to see this as the basis for the success of the Eurasians in overtaking peoples from other continents later in history (e.g. Diamond 1998).

In light of all the above, it not only becomes clear that China was not isolated from the rest of the continent, but also that it constantly engaged in interactions with the peoples beyond its cultural frontiers; furthermore it seems certain that it must have received benefits from that circumstance. China was an extension, a part indeed, of this continent-wide economy from very early on. Jade was not the only precious commodity that came through the steppes to China, and animal products not all the nomads and other Central Eurasians traded with the Chinese. We now know that the domesticated sheep and horse both were introduced to China from the West; also the chariot – a complex piece of machinery that managed to revolutionize not only early Chinese warfare, but also altered society – is accepted to have entered China together with the horse (DiCosmo 1999: 903). Some claim that bronze metallurgy and the idea for writing came to China from the West, as well (Sagart 1999: 196; An [Zhimin] 1998: 60); the early "Silk Road" trade system would certainly have allowed for these to be transmitted just as well as for animals and military equipment. Other innovations that had profound impact on Chinese society, warfare, and economy seemingly came to China from the steppes, but these cases are not always universally acknowledged; some of them will be at the center of this work.

Two especially interesting innovations appear in China during the late Eastern Zhou Period, i.e. the Spring and Autumn and, in particular, the Warring States Periods, an era that is noteworthy in itself, as the great internal struggles and constant upheavals of political and social order mark one of the most important turning points in Chinese history. The innovations in question are iron metallurgy and horseback-riding; they are mostly of a military nature, or would at least seem to have had tremendous impact on military matters. In fact, any innovation during that specific period of time would have had the potential to alter the outcome of struggles and, therefore, Chinese history; these two innovations are of such a basic and ground-breaking nature that their influence must be assumed to have been significant indeed. And if they were to have come from the steppes, this would again lend great weight to China's early interactions with the steppe peoples and its Silk Road connections.

The objective of this work is it to bring a variety of previous scholarship together in an examination of China's relationship with the steppes and, especially, of the influence this rela-

tionship could have had on China. The work will concentrate on the latter part of the Zhou period for the above-stated reason that its being a period of turmoil and upheavals coincides with the arrival of a few particularly exciting innovations; this small, but disproportionately important period of Chinese history will be used to exemplify the nature of pre-imperial China's contacts with the outside world, closely following the questions: Did the innovations of this period arrive via the steppes? If so, would they have had an impact on the developments within China? What impact would that have been? In answering, or trying to answer, these questions, the work will show the nature of China's contacts which made the arrival of innovations possible, and the influence these contacts thereby had on the development of Chinese history.

The general outline of the work will follow the steps necessary for answering these questions. The first chapter will set the stage and background for the analysis and introduce the actors. From a Sinological point of view, it seems necessary to introduce the peoples living beyond the Chinese borders, as they have largely been ignored or, at most, seen as hostile adversaries to the great Chinese civilization, and therefore their identity and history cannot be assumed to be common knowledge. We will see who the nomads were, where they lived in relation to the Chinese, and also take a look at their economy and way of life which will illustrate their importance for the budding trans-cultural trade system. We will also explore the role different ecologies and economies played in creating and sustaining this trade system of which early China was a part, and consider the earliest exchanges that took place at the border between early China and the nomadic world, thereby showing the nature of China's interactions with its steppe neighbors.

The second chapter will then set out to show that the important innovations of the time, iron metallurgy and horse-riding, were adopted from the steppes by considering historical accounts, archaeological data, and linguistic issues, and also take a look at related items and technologies such as horse tack or specialized weaponry, which might have been adopted into Chinese military equipment along with the innovations. Finally, the third chapter will analyze the impact these innovations would have had on the distribution of power and the political and social developments in Warring States China. Would the innovations in question actually have been able to change the face of battles? Could specific occurrences really have been conditioned by access to or lack of access to the one or other innovation? What other

ramifications did their adoption have for China and its development? The discussion of these questions will illustrate the importance of these innovations for China and thereby show the significance of the interactions with the steppes in general. We will also examine the role of the relations with the steppes in the ultimate outcome of the Warring States' struggle for power: Qin's victory and subsequent unification of China.

Chapter 1: The Steppe as Neighbor: China's North-Western Borders as a Stage for Trans-Cultural Interactions

1.1. Dramatis Populi

The first chapter is going to set the stage for this investigation and establish a mental map of the acting peoples and nations involved. The Chinese side of the border across which the exchanges took place does not need to be explained to any particular depths, as the paper is departing from a Sinological point of view from which the basic relevant historical and geographical facts should be familiar. As was explained in the introduction, this work will be concentrating on a relatively short and yet very important part of Chinese history: the end phase of the Spring and Autumn (771-476 BC) and the Warring States (475-221 BC) periods of the Eastern Zhou dynasty, up until 221 BC, when China was first unified under the rule of its first emperor 秦始皇帝 *Qín Shǐhuáng-dì*. This period marked by constant conflict and upheavals of social and political order is important not only because it constitutes a pivotal point in Chinese history; it was also the period that saw the advent of two of the most important technical and military innovations since the war chariot: iron metallurgy and cavalry warfare. The significance of these innovations for a China that was constantly at war can be imagined, and trying to assess their actual role in the battles and struggles for power during that period will be the subject of a later chapter in this work.

It might be interesting to note that using archaeological findings from Warring States China faces some dire limitations, since it is not possible to clearly define borders for the states and kingdoms that constituted China in this period. During the Spring and Autumn Period, the rule of the Zhou dynastic house was still largely in place, although smaller states started to spring up throughout the territory as dependencies and duchies started to gather increasingly more power under their own jurisdiction, thereby sapping the influence and strength of the ruling dynasty. In their struggle for more power, these upstart states started to go to war with each other over territory, which led to the constant change of territorial borders and the assimilation of smaller, weaker states by the stronger ones. A few of them were especially successful, and those are the main actors of the Warring States period; by then, the

Zhou dynastic house was nothing more than a small enclave without real power and was finally overtaken by Qin in 256 BC. The remaining seven most powerful states continued their struggle and waged wars on increasingly large scales: 趙 Zhào, 韓 Hánn[2], 魏 Wèi (the three of them forming the state of 晉 Jìn until its breaking apart in 403 BC), 秦 Qín, 齊 Qí, 燕 Yān and 楚 Chǔ (e.g. Lewis 1999: 916-919).

But not only were the borders within China and between the different states never the same throughout this period; the marginal states also expanded their territory, thereby encroaching on formerly foreign territory. Most notable in this case were the northern states Qin, Zhao, and Yan, which expanded north and west, approaching and then assimilating the territory of nomadic peoples. As hard as it is to define the borders using historical sources – due to the fact that the different Chinese states shared more or less the same cultural identity, with about the same customs, technological level and artistic preferences, archaeological findings cannot answer the question of which state held exactly which territory during which period of time, either.

1.1.1. The Steppe Peoples

The history of the non-Chinese side of the border to the steppes is not quite as well-known, even though the areas in question now constitute the western and northern parts of today's China. The border roughly ran from Heilongjiang and Liaoning in the north-east, over Inner Mongolia, northern Henan, Hebei, Shanxi, and Shaanxi, to Ningxia and Gansu in the north-west (DiCosmo 1999: 889). The main reason for the obscurity that surrounds the people who lived there in early times may be that they did not leave written records of their own, so that only the Chinese historical records remain to testify for them. Many of these Chinese records depicted the foreign peoples of the steppes as aggressive and warlike, always greedy for the superior products the peace-loving Chinese had to offer, and therefore a constant threat that needed to be eliminated.

Despite the fact that these descriptions were mainly designed to serve the political needs of Chinese rulers at the time, as they needed justification to attack the foreigners in order to seize new territories, contemporary scholars have come to rely on these sources only, and

[2] Note the divergent spelling here, which is used throughout the work to clearly distinguish the Warring State from the 漢 Hàn dynasty.

have mostly chosen to ignore the steppe peoples' role in Chinese history apart from their occasional appearance as the evil aggressor threatening the great Chinese civilization. Archaeology for these areas of China is still in its infancy even at present, and so the image of the steppe peoples as wild, aggressive "barbarians" has persisted unchallenged for long times. Only in recent decades have scholars started to point out their important role and turn those previous assumptions on their heads (e.g. Beckwith 2009: 320-362; DiCosmo 1994, 1999, 2004). A short overview over the geographic and demographic conditions, that is the areas in question and the people who lived there as well as their culture and economy, should suffice to build a basis for this work.

Even as early as the Shang dynasty there were distinct cultures living in the steppes with whom the Chinese entered into relations and also fought over resources. The Shang referred to them by a variety of names that might have designated different ethnic groups, but probably did not bear any relation to their political association (DiCosmo 1999: 907). These steppe cultures were separate from the Shang cultures on the Central Plains, in that their economy followed a slightly different model of subsistence; due to ecological reasons they always had a stronger focus on animal husbandry, even though their economy often focused on oasis agriculture. From the late 2nd millennium onwards, the shift from an agriculture-based to a more and more pastoral-based economy caused the cultural rift to the Central Plains to become ever more pronounced (DiCosmo 1999: 886). Despite their common economy, the various political and social groups were in no way unified and exhibited different customs and material culture while sharing certain other traits, such as some artistic elements and a metallurgical tradition easily distinguished from the Chinese one.

From around the beginning of the 1st millennium BC, the advent of horse-riding precipitated the spread of the fully nomadic form of pastoralism throughout the Eurasian steppes (Anthony 2007: 222). The horse played a vital role in this transition and became the most important asset for life in the steppes. Horse-riding, pastoral nomadic communities are attested to have roamed the steppes to the north-west of China from around the 8th century BC (DiCosmo 1999: 886); they were the main actors on the stage formed by the borderlands between the Chinese cultural zone in the Central Plains and the Central Eurasian steppes. However, they appear in Chinese documents very late: Horse-riding pastoralists are first mentioned only in the 4th century BC, when a party of 匈奴 *Xiōngnú* or 胡 *Hú* are said to

have been part of a joint force of Hann, Zhao, Wei, Yan, and Qi that attacked Qin (DiCosmo 1999: 960); this has been taken to indicate a sudden appearance, even though they must have been wandering areas close to the Central Plains for several centuries.

Many scholars explain this disparity between the nomads' appearance on the steppes and their first entrance in the historical records by assuming that no direct contacts had occurred between them and the Chinese peoples before that date (DiCosmo 1999: 926). In this context, so-called "intermediary" peoples are often mentioned: the 戎 *Róng* and the 狄 *Dí*, the 鬼方 *Guǐfāng*, the 獫狁 *Xiǎnyǔn*, and many other ethnically and culturally non-Chinese peoples (DiCosmo 1999: 919ff). They were "intermediary" in that they were, by that time, still sedentary or semi-sedentary with a mixed economy of farming and herding and lived in territory that was marginal to both the Chinese and the nomads. That way, they might have constituted something like a "buffer" between the agriculturalist Chinese and the full-blown nomadic steppe pastoralists.

Apart from their economy, little is known about these peoples. It is not clear whether their Chinese names were ethnonyms or not; "Rong", for example, was often used "as a 'blanket word' for many foreign peoples without specific ethnic connotation" (DiCsomo 1999: 921). It seems that they were distinct communities interspersed within the political centers of China, with markedly different customs and a separate political organization; they were often at conflict with the Chinese, and we know that the Rong were the ones who forced the Zhou to move court in 770 BC (DiCosmo 1999: 922). But these "intermediaries" also seem to have entertained busy relations with the steppe nomads; the Di of 中山 Zhongshan, for example, apparently retained many steppe customs even as they gradually sinified over time (Yang [Jianhua] 2009: 156). In the course the Warring States Period, and in particular due to the expansionist endeavors of the northern states Qin, Zhao, and Yan, these peoples were rapidly swallowed up, their territory and their populations integrated within Chinese borders. In doing so, the Chinese states eliminated the so-called "buffer-zone" and might have come into direct contact with the full nomadic pastoralists beyond for the first time (DiCosmo 1999: 892).

It is, however, just as possible that there was direct contact before that time, but no historian saw this as worthy of being included in a history of the Chinese states – most mentions

of the nomads are connected to warfare in some way, and indeed, the topics covered most extensively by the traditional histories are of a political or military nature. It could be then, that a historian at this time would not have taken note of trade or other peaceful and uneventful exchanges that might have occurred on a regular basis and certainly often enough to make them commonplace. Whether direct, or indirect, though – there is no doubt that interactions and exchanges took place between the steppe nomads and the Chinese from early times on.

Who were the nomads that lived in the steppes adjoining ancient China? Culturally, they belonged to the same continuum and shared not only most of their material culture and technological level, but also many customs and artistic preferences. This was probably due to their mobility as well – they exchanged goods, knowledge, and maybe even parts of their populations among each other, and each group of nomads seems to have had a mixed ethnic as well as linguistic background. It has been proposed that the Chinese names for the nomads might in fact have referred to ruling dynasties, and the question of association with one or the other nomadic group was more one of fealty and inhabited territory than one of culture or ethnicity. In any case, their cultural unity makes it equally hard to identify the dwelling grounds of a certain nomadic tribe through archaeological findings as it is to exactly define the borders of one of the Warring States.

There were several nomadic tribes, or dynasties, in the vicinity of pre-imperial China. The first nomads mentioned in Chinese historical documents are the 胡 *Hú*; the word *Hu*, in ancient texts, is clearly used to refer to all kinds of nomadic populations – a "blanket word" much like *Rong* – and it is in fact one of the words that are often and incorrectly translated as "barbarian" by western scholars; while *Hu* does not seem to be an ethnonym, it certainly does not carry any of the connotations of "barbarian" either (Beckwith 2009: 359). The cultural or ethnic identity of the Hu nomads is unknown, although it is commonly thought that they were the predecessors of the Xiongnu, or even the Xiongnu themselves under a different name.

The 匈奴 *Xiōngnú* are probably most famous, or rather infamous, for posing a major threat to the Han dynasty later in history. At the time of the Warring States, they were horse-riding nomadic pastoralists and occupied vast territories north of the Chinese states Zhao and Qin,

where they roamed the fertile pastures of the eastern steppes from the Altai Mountains to the Manchurian Plains with their herds of cattle, sheep, and horse. However, they also included many settled and partly agriculturalist populations within the set-up of their society and ruled over settled communities for long stretches of time (Mallory and Mair 2008; DiCosmo 1994: 1096). Their ethnicity is not fully agreed upon; they are often thought to have been "Proto-Mongolians", but this is pure speculation. Culturally, they are identified with the Scythian continuum (DiCosmo 1999: 890-1), though it is unknown what language they spoke. Later, they became a strong, unified force and powerful enough to defeat the Yuezhi in 176 BC, thus forcing them to migrate westwards.

The 月氏 *Yuèzhī* were the most powerful nomadic confederation at the time of the late Eastern Zhou, which is well illustrated by the surprise of Han dynasty historians over the fact that the Xiongnu had managed to conquer them (Benjamin 2000: 152). The Yuezhi are traditionally being located in the western part of today's Gansu region (Enoki et al. 1999: 171), but it is clear that they must have occupied a very large territory stretching from China's western borders through the Hexi corridor and into the Tianshan range and the Tarim basin. Most scholars now agree that they must have been Indo-Europeans and speakers of the one or other variant of the Indo-European language Tokharian (Benjamin 2007: 23-5); in fact, the name 月氏 with the modern Mandarin pronunciation *Yuèzhī* must be reconstructed to Old Chinese *Tok^{w}ar-ke, literally meaning 'Tokharian kings' (Beckwith 2009: 380-383). Archaeology shows that there were Caucasoid people in the Tarim basin as early as 2000 BC (Renfrew 1998: 203); it is likely that they were early Tokharians, and the Yuezhi therefore their descendants.

The 乌孙 *Wūsūn* were a nomadic tribe said to have occupied the same region as the Yuezhi, apparently living close to them while still retaining their independency (Mallory and Mair 2008). Their name is reconstructed as *Aświn or *Aśvin (Beckwith 2009: 376), and might be a transcription of the Old Indic *aśvin* meaning 'the horsemen'. Their ethnicity is not firmly established, but it is likely that they were Caucasoid people like the Yuezhi. They might even have been Tokharian speakers as well (Narain 1990), or speakers of another Indo-European language, like, indeed, Old Indic; however, not much is known about them. The 羌 *Qiāng* were another tribe of nomads living in the mountains to the south of the Hexi corridor. They are usually said to have been Tibeto-Burmans; however, the name – meaning "the Chario-

teers" – seems to have been used to refer to Indo-Europeans in Shang times, and was revived to refer to Tibeto-Burmans living in the mountains to the south of the Hexi corridor only in the Han dynasty (Beckwith 2009: 375). It seems very likely that the Qiang were actually Indo-Europeans; their relation to the other Indo-Europeans in the area, like the Yuezhi, would certainly serve as an explanation to why part of the Yuezhi are recorded to have joined the Qiang after their displacement by the Xiongnu (Watson 1993: 234).

In the far west of our "stage", to the west and south of the Tarim basin around Khotan, lived the 塞 *Sài* (Zhang 1999: 283). The Chinese name *Sai* is another variation of Saka, Sogdian or Scythian – all of which mean "the Archers" (Beckwith 2009: 377-380). The Scythians were equestrian nomads who dominated the Central Asian steppes from the beginning of the 1st millennium, and accepted to have been North/East Iranians speaking Saka, an Iranian language (Beckwith 2009: 58). The eastern Scythians living in the Tarim basin had probably migrated there some time after the beginning of the 1st millennium BC, but had certainly arrived by the 8th century BC; they were the ones who carried the early nomadic lifestyle into the eastern steppes where it spread quickly in the subsequent centuries (DiCosmo 1999: 909).

Sometimes, the Yuezhi are identified with the Scythians (Enoki et al. 1999: 174); while we have seen above that they were Tokharians, it is true that they, as well as all the other nomadic groups we have mentioned so far, belonged to the so-called "Scythian continuum" – a term that refers to the entirety of the early nomadic cultures of the Eurasian steppe (DiCosmo 1999: 891). Apart from the nomadic lifestyle, this complex involved the presence of a certain assemblage of cultural signifiers, called the "Scythian triad" by DiCosmo (2004: 58): weaponry, horse-gear, and objects decorated in animal style. Another "diagnostic feature" of Scythian culture was the use and spreading of iron technology (Wagner 2008: 93) and swords with iron blades (DiCosmo 2004: 58); an important fact to remember for later in this work. The Indo-European speakers that lived to the west of China are generally believed to have been the ones introducing the horse into China – this seems to be amply attested by the obvious Indo-European etymology of the words for "horse" in all the East Asian languages (Beckwith 2002: 130-3).

1.1.2. Nomadic Language, Society, and Economy

In order to examine the society and economy of the nomadic population across the Chinese borders in greater detail, all of which will illustrate their importance for the system of exchanges this work is going to discuss, we will take a closer look at the various nomadic groups – most of all, the Yuezhi. They are not only the most powerful tribe of the time in question; they are also covered extensively in scholarship, some of which is quite recent (see Benjamin 2000, 2007; Liu [Xinru] 2001; Enoki et al. 1999). Due to the cultural continuity of the Central Eurasian nomads, most of what can be said of the Yuezhi can be transferred to the other tribes as well.

As we have seen, the various peoples of the steppes probably spoke a variety of languages; while we know that the Yuezhi must have been speakers of Tokharian, the case is usually not as well-known for the other "tribes", although most or even all of them seem to have spoken one or another Indo-European language. The earliest documents in Tokharian were found in the northern and western parts of the Tarim basin, where Tokharian apparently was a major language in the local oasis city-states, most prominently Kucha, Karashahr, Turpan and Loulan (Kroraina). They are dated to the first millennium AD, but the language was spoken there probably as early as two millennia before (Narain 1990). This is important to know; one Chinese word, 蜜 *mi* 'honey', is widely accepted to be a loanword from a Tokharian language (Pulleyblank 1966: 10). Even though it is currently the only adoption from that language that most traditional scholars can acknowledge, theories that Chinese shares some roots with Indo-European have been put forward a long time ago (Chase 1861), and many more loanwords from early Indo-European languages have since been conclusively shown to exist (e.g. Beckwith 2009: 402; Lin 1998).

The existence of these loanwords in the Chinese language shows that some kind of contact must have taken place between Tokharian speakers and Chinese peoples in early times. Loanwords usually cross into another language together with the thing they describe; in this case, honey was clearly a kind of produce previously unknown to the Chinese, and in the process of learning about this new food and adopting it into their own food production repertoire, they started to use the foreign word to refer to it. Other loanwords therefore can give clues about more things that were adopted by the Chinese from the Tokharians or others; some of these clues will appear in a later chapter.

The existence of loanwords in the Chinese language also shows that Tokharian-speakers must have frequented areas close to the Chinese borders, in order for the exchanges to have taken place. The 史記 *Shǐjì* (*Shiji*: juàn 123; Liu [Xinru] 2001: 267) reports that, before their eviction by the Xiongnu, the Yuezhi occupied territory from the Qilian mountains to Dunhuang, which would place them in the Hexi corridor in present-day Gansu – a natural corridor about a thousand kilometers from end to end, framed by the Qilian range to the south and the Gobi desert to the north. It connected the westernmost edges of Chinese territory with the numerous wealthy city-states in the Tarim basin in the west and the world beyond. Someone controlling the Hexi corridor would effectively control the major routes for trade and any of China's exchanges with peoples to the west; this made the area a pivotal strategic point (An [Xuqiang] 2009: 60-1). The Yuezhi dominated this part of the steppes until their eviction by the Xiongnu during the Han dynasty; it is easy to see how they might have attained their status as the most powerful tribe with most of the trade from the West to China and back passing through their hands.

However, it has been noted that the climatic conditions of the Hexi corridor were not ideal for intensive pastoralist activities, as it consists of mainly barren stretches of desert interspersed with oases (Benjamin 2007: 60); this seems to contradict the information that the pastoralist Yuezhi mainly lived there. Some scholars (Mair 1998; Lin 1998: 481) have argued that the 祁連山 Qílián Mountains of the 漢書 *Hànshū* do not necessarily refer to today's mountain range to the south of the Hexi corridor, but to the 天山 Tiānshān Range itself; in fact, the ancient Chinese probably did not distinguish between the two mountain ranges, so the Qilian Mountains are to be equated with the Tianshan Range. This would extend the area the Yuezhi are reported to have occupied farther to the west, into the Turpan basin and the northern and western Tarim basin, which is consistent with their linguistic connection to the city-states in this region.

From the presumably arid conditions in the home regions of the Yuezhi it is often concluded that Yuezhi society and economy cannot have been as uniformly nomadic pastoralist as it has been assumed. However, the assumption that the climatic conditions of the Hexi corridor and Tarim basin did not allow for extensive pastoralism is faulty, as it becomes amply clear from historical sources as well as from paleoclimatic data that the region was a lot wetter a few thousand years ago (Zhang 1999: 282); in antiquity, the area around Loulan was

forested, and tigers were found living along the rivers of Lop Nor until the late 1800s (Hill 2009: 160). The progressive desiccation since that time is well documented and is known to have caused major economic changes (Shishlina and Hiebert 1998: 232).

It is true, however, that Yuezhi society and economy was not uniform – neither was that of any other nomadic tribe, for that matter. For instance, the Yuezhi must have included at least some of the city-states of the Tarim basin within their territory for long stretches of history, as the linguistic connection alone suggests; this is corroborated by the fact that those states were conquered by the Xiongnu immediately after their final victory over the Yuezhi around 176 BC (Ma and Sun 1999: 227). It has sometimes been argued that the Yuezhi dominated over these city-states, extracting tribute in form of agricultural products from their sedentary subjects. However, their common language suggests common ancestry; these populations would have made up some part of Yuezhi society, or vice versa, or were connected to them in some other way that probably reflected a mutually beneficial relationship more than one of dominion and servitude (DiCosmo 1994: 1112).

Other nomadic tribes may have been more exclusively nomadic; and especially the territory occupied by the Xiongnu was perfectly suited for intensive pastoralist pursuits: The Ordos region comprised some of the best pasture lands in this part of the world. The Yuezhi, too, dominated at least part of this region for extended periods, and it is clear that the Xiongnu started out as their vassals (Beckwith 2009: 383). Even so, it is certain that the Xiongnu also included sedentary or semi-sedentary agriculturalist populations within their territory and society; in fact, even the most specialized nomadic groups engaged in some farming activities, sowing and harvesting, in a limited way, whenever the ecological conditions and their migration cycles allowed for it (Sinor 1972: 172; DiCosmo 1994: 1096). However, as the nomadic people left no written records themselves, we are limited to what the Chinese committed to writing about them, and they seem to only have come into direct contact with the more mobile, that is, all-out nomadic parts of their society.

Not only was nomad society complex, their economy subsequently was diverse as well. The oases in the Tarim basin as well as the oases in the Hexi corridor favored oasis-based agriculture, but the vicinity of steppe pastures would have made pastoralist activities profitable and worthwhile; they would have complemented their economy and fulfilled the economic needs of a greater number of people. The parts of the oasis societies that dedicated them-

selves to this herder-husbandry economy must have become increasingly specialized over time; with the arrival of the horse and the fully nomadic lifestyle with the Scythians in the 1st millennium BC, these people eventually separated from the oasis environment and became the nomads (DiCosmo 1999: 909), including the ones that appear as the Yuezhi in Chinese historical accounts. However, they retained their connection to the sedentary agriculturalists in the oases, even perhaps remaining to a degree dependent on their products (Barfield 2001: 235).

The Yuezhi, at least, seem to have been known to the Chinese early on – they are first mentioned in the Zhou Annals of the 史記 *Shiji* as suppliers of jade, a material that was highly revered in China from the 2nd millennium BC, but of which no local supplies existed (Benjamin 2007: 34). In fact, all the nephrite jade excavated in China from this period has been shown to have come from Khotan, in the far west of the Tarim basin, several thousand kilometers from the Central Plains (DiCosmo 1999: 902). It is now largely uncontested that jade was brought to the Chinese by the Yuezhi – some have even proposed that the Chinese name for the Yuezhi is derived from the name for jade, or vice versa (Lin 1998).[3] The Yuezhi are also mentioned early for their trade in horses, which became a vital asset for the Chinese after they acquired the war chariot about 1200 BC. The Tokharians, therefore, seem to have relied on trade as part of their economy from very early times.

The nomads' diverse economy was a direct consequence of the environment they lived in. For the oasis-based people, using the steppes surrounding their settlements for grazing herds of domestic animals allowed them to make use of areas hostile to agricultural methods of production and to draw on their natural resources, providing a living for a larger number of people than just oasis agriculture would have allowed for. Their livestock also was a source of wealth that should not be underestimated; it allowed for far greater surpluses than agriculture, and was therefore a basic resource for trade endeavors. In fact, the average nomad at the time was generally better fed than a peasant in the adjoining Chinese feudal states, and probably led a much easier life with more leisure time at their hands (Beckwith 2009: 76). This, in turn, might be one of the reasons why the arts and crafts were practiced widely and with great skill among the nomads, as well.

[3] However, the latter is phonetically unlikely; see Beckwith 2009

This goes contrary to the common image of nomads that has long dominated public knowledge as well as academic scholarship – the needy, greedy nomad who has to pillage and plunder for a living (e.g. Sinor 1978). In general, there was no need for the nomads to go look for loot among the "innocent farmers" who were their neighbors – trade relations were much more lucrative, held much smaller risks, meant less expense of labor, and thus were a much more reliable and sustainable source of proceeds.

Trade, therefore, was a major part of nomadic economy. The mobility brought about by their way of life carried the nomads great distances; when they left the vicinity of their original agriculturalist neighbors, they had to trade with other, foreign agriculturalists to supplement for the products they were used to. Also, it is likely that the society and political order of the Yuezhi, like most of the Central Eurasian peoples at the time, and in particular those of the Scythian continuum, were built around the person of a single leader; these leaders usually had a personal guard of sworn warriors to fight for them to the death: the *comitatus* (Beckwith 2009: 59). These warriors needed to be maintained with gifts, for example gold or silk, and the comitatus would often grow in size the more powerful a leader got, sometimes swelling to numbers of several thousands. The high cost of sustaining such a comitatus thus ensured that nomadic societies all over Eurasia were dependent on trade, as the very stability of their society relied on it (see Beckwith 2009: 26-7). Through this, they became the major driving force behind the trade economy of Central Eurasia.

As we have seen, the nomads had a lot to trade. Not only did they have a surplus of all kinds of animal produce and of course livestock (Torday 1997: 1); their controlling large parts of the Tarim basin meant access to invaluable natural resources not at all limited to nephrite jade – there were deposits of iron and copper, for example, which were necessary for the highly developed metallurgy that became an integral part of their material culture (Rolle 1980: 137; Beckwith 2009: 9); and of course other products could be acquired from distant peoples, to carry them along and trade them off to the Chinese with great gain. In fact, it seems that the power and wealth of the Yuezhi, for example, was based largely on successful trade and exchange with the Chinese (Benjmain 2007: 44).

1.2. Ecological borders and China's early trade relations with the steppes

Despite the fact that nomadic economy was not purely pastoralist, it has to be noted that differences in economy were a major motivator for the trade in which the nomads widely engaged. As has been noted above, the nomadic parts of steppe societies retained close contacts with the sedentary oasis-agriculturalists, and they must have exchanged food products since the very beginning; but trade would never have been restricted to just agricultural or pastoral produce, when there were other valuable things to exchange. When pastoralists adopted the nomadic lifestyle and horses greatly expanded their reach, they carried the trade with agriculturalists, which they were used to, to other agriculturalist peoples they encountered – such as the Chinese. It seems likely that they made no great distinction between the trade with their "own" agriculturalists or foreign people who happened to adhere to the same economy and had basically the same or at least similar products to exchange.

The reason why the nomads had an economy different from that of their agriculturalist neighbors is, as said above, due to the nature of their environment, that is, the ecology of the territories they occupied. Their lifestyle of raising domesticated animals like cattle and sheep in vast herds developed in accord with the ecological conditions in the steppes. Extensive pastoralism depended on vast stretches of land that could be grazed on; the nomads were required to move with the seasons in order to ensure that the grass would grow back in sufficient quantities (DiCosmo 1999: 910). Therefore, as the ecological preconditions of their home grounds were the reason for their economy, they ultimately also were the reason for their mobility and the extended roaming that carried them to the edges of other civilizations.

The term "ecological border" (Christian 2000: 72-3) is often used to refer to the dividing lines between nomadic pastoralists and agriculturalists. According to some scholars, these lines are of utmost importance when looking at the history of the Eurasian landmass: Due to the stark difference between the respective economic systems of the pastoralists on the one and the agriculturalists on the other side, a mutual need for exchange arises and draws people from either side to trade with each other over this natural border. Basically, pastoralists trade for agriculturalist produce by paying with their own excess animal produce, and vice versa, thus complementing the nutrition on both sides for mutual benefit. But in this

trade, other things would be exchanged alongside the food products, such as luxury items, animals, and other goods that made the barter even more attractive; but also less tangible things like new technologies, knowledge, ideas, germs, and so on would pass back and forth on these occasions.

Ecological borders thus are the very reason for the unity of the entire Eurasian landmass: the vigorous exchanges they incented were the basic mechanism that allowed for the emergence of the vast trans-continental trade system that would later be known as the Silk Road. The sustention of this economy, while of course also relying on and needing the urbanites and farmers, depended to a large part on the nomads and their mobility: Their lifestyle carried them from the edges of one agriculturalist territory to others, and allowed them to carry goods and ideas to remote areas, where others of their kind continued to carry them onwards – thereby allowing these things to reach both ends of the continent at times where direct communication was beyond the means and ambitions of any peripheral power.

There are other scholars (Anthony 2007: 463; Torday 1997: 1) who think that ecological borders would in fact provide more of an obstacle than an instigator for exchange, as the mutual distrust for a lifestyle so radically different from one's own would have impeded interactions in the first place. However this view does not take into account the many populations that practiced mixed economies; also, people who regularly interacted with people adhering to the other economy would not retain their reservations for very long. Even initial distrust would most likely not hinder people from exchanging things they considered useful to have; and in fact, historical sources make it absolutely clear that trade between settled and nomadic communities was very widespread. It is also evident from later instances that it definitely did not keep sedentary societies from employing foreign nomadic troops in their armies (Hsu 1999: 573; Twitchett and Loewe 1986: 335). Finally, even if initial distrust would have delayed the adoption of a new technology across an ecological border for a few hundred years, this is hardly a significantly long time seen on the scale of the development of humanity.

The value of the concept of a trade-inducing ecological border for this work is shown by the kinds of exchanges that have clearly gone on between early China and the steppes from early times. Chinese works of art, like lacquerware and bronze mirrors, have been found in areas that were unknown to the Chinese at the period of their transmission (see Rolle 1980:

41ff). This clearly shows that there were indirect exchanges well before the "official" opening of the Silk Road in the final centuries BC. We have already seen that the Yuezhi, for instance, were known for their early trade relations with China – whether they were actually directly trading with Chinese agriculturalists or with intermediary peoples is of no great account, as their jade and horses reached the Chinese either way.

Domesticated horses are now accepted to have been introduced to China from the steppes (Beckwith 2009: 396). While the Chinese seem to have been aware of the existence of the wild Przewalski horses that lived on the verges of the Chinese cultural zone, there are no indications that they tried to domesticate the animal. Research has shown that the horse was first domesticated sometime around 4800 BC in the Pontic-Caspian steppes (Anthony 2007: 201); from there, the domesticated horse and knowledge about horses and their handling seems to have spread in all directions, reaching the general region of the Tarim basin in the 2nd millennium BC together with the war chariot (Anthony 1998, 94–5). Horse-riding seems to have started being practiced there only from the 8th century BC, and only little earlier anywhere else. The Chinese adopted horse-riding for military purposes in the 4th century BC, and there is no doubt that they consciously copied it from the steppe nomads they encountered on their borders (Goodrich [C. S.] 1984: 280). We will discuss this point in detail, as it falls into the scope and time frame of this work.

The chariot was another very important innovation that entered China in the 2nd millennium BC along with the domesticated horse (Piggott 1992: 63; Shaughnessy 1988; cited in Beckwith 2009: 44). It would dominate the battlegrounds of China for the subsequent millennium and therefore was of quite some importance: The chariot is a piece of highly developed and complex machinery, and it arrived on Chinese turf already fully formed, with no vehicles in prior stages of development ever excavated. It is now largely uncontested that it came to China via the steppes. Although not an innovation in the usual sense of the word, the Zhou themselves ostensibly were of steppe origin – probably Central Eurasians who migrated into the Central Plains, where they set up court after crushing their predecessors, the Shang, with the help their chariots (Kelekna 2009a: 137-8; Beckwith 2009: 45-6).

All this illustrates that the Chinese civilization did not develop in isolation, as has usually been assumed. There were interactions, even long-distance, international (albeit indirect) trade with distant places and peoples already long before the actual Silk Road was delibe-

rately being used for trade by the Chinese and others (Beckwith 1991: 184). In the following, we will look at the innovations that have not yet been discussed in great detail or that are not widely accepted throughout academia, that came to China during the rough period of the Spring and Autumn and Warring States. Horse-riding has already been mentioned; it was, there is little doubt about that, adopted by the Chinese around the 5th century BC. It is likely that there were more interactions between the Chinese and the nomads connected to this – items related to the riding of horses were probably adopted as well, and a tremendous amount of knowledge would have needed to be transmitted in a very direct way: Horse-riding is a complex and difficult activity, and it seems logical to assume some form of transmission through teaching.

Also, the period in question saw the most important innovation for a very long time: the advent of iron metallurgy, its spread and eventual wide-spread use. There are many clues that iron technology was another innovation that came to China from the West via the steppes, although this view is not quite as widely accepted; but as we will see, archaeology can show that iron technology was one of the innovations that came to China from the steppes (e.g. see DiCosmo 1999: 892). The following chapter will address the question whether both horseback-riding and iron metallurgy were indeed innovations from the steppes, which parts, pieces, or aspects of them were transmitted, and how closely the Chinese must have interacted with their steppe neighbors in order to obtain, learn, or assimilate a new item or technology.

Chapter 2: Iron Blades and Horseback-Riding: Innovations from the Steppes

Chinese historiographers who write in or about the Warring States period often like to point out the savage nature of the nomads and report vicious attacks from mounted raiders (DiCosmo 1994: 1092). The emphasis on the one-sided nature of the aggressions from the steppes has been retained up until the present, where there are still scholars who take these reports to mean that mounted nomads were aggressive and warlike by nature and a permanent threat on the borders of pre-imperial Chinese civilization. What is often neglected is the fact that the areas the nomads raided often had, in most cases, previously been part of their own territories until they were annexed by a Chinese state; moreover, the raids often were part of a protracted war of attrition between the Chinese occupation forces and the dislocated nomads, wherein the Chinese themselves would frequently make the first move and launch campaigns into foreign territory (DiCosmo 1999: 962). The ancient historiographers' tendency to paint the nomads as blood-thirsty, greedy raiders and a serious menace to the Chinese states must be interpreted as being at least partly aimed at justifying the invasion of foreign territory. As long as the nomad tribes were seen as a major threat, this would make for a convenient excuse to attack, conquer, and annihilate under the guise of having to "defend the borders" and "eliminate a threat".

As busy as China's interactions with the steppe peoples were at all times, and whether they were characterized by friendly exchange or aggressive expansion and retaliation, it must be remembered that the main focus of the Warring States was each other, their attention faced inwards rather than out. While the Chinese states on the periphery continually expanded their territories at the cost of foreign peoples – which ultimately was the reason for most of the enmity occurring during that time – this was not primarily aimed at "securing their flanks", as it has often been argued. The nomadic peoples were, especially during those early times, never able to pose a serious threat to any of the Chinese states[4] – they might sometimes have successfully raided peripheral villages and settlements, but those raids were no severe danger a ruler might have to consider when planning a war. Instead, the expansion of

[4] For example see Beckwith 2009: 338-340, debunking the myth of the "barbarian menace"

the Chinese peripheral states was directed at gaining increased power and resources that would help them in their struggle against their Chinese rivals.

As the main focus of the contending Warring States was each other, each and any advantage was sought with a fierce energy. It might be said that the rivalry that characterized the period was a very important motivator for innovation and one of the reasons why technology and ideology thrived and innovations were so abundant. Many revolutionary new technologies were born from the conflict, and the reflection on the conflict brought new insights and spawned philosophical schools. During the Warring States period, the Legalist school of thought came into existence, with a new approach to the organization of society by strict implementation of the law, and several works on military strategy, among them the famous 孫子兵法 *Sūn Zǐ Bīngfǎ,* give some insight into the unprecedented importance of tactics for the massed battles of the time.

The innovations that yielded the most immediate and tangible results in the constant struggle for power were of a technological nature. During the Warring States Period, the Chinese invented the cunning crossbow mechanism that would later spread to the West and become a vital component in the warfare of medieval Europe; the crossbow quickly came into widespread use towards the end of the 3rd century BC (Lewis 1999: 622). While the first crossbows were cumbersome to carry and difficult to reload, they had great reach and penetrating power; an important asset, as around that time body-armor made from bronze or iron scales was taking the place of the boiled and reinforced leather of earlier suits (Dien 1981: 6-7). The weapon was ideal for the armies of the Warring States period: Whereas battles in earlier times were elite affairs between nobles and mostly fought from chariots, the Warring States Period saw the advent of large infantry armies, often drafted from among the common people, who were pitched against each other in mass campaigns led by professional generals. Large armies and amateur soldiers necessitated new tactics as well as different weaponry; the ideal weapon naturally was one that could be mass-produced and required little training for effective use.

The horse-drawn chariot was gradually replaced by divisions of horse-mounted cavalry, which entered the field for the first time during the Warring States Period; this new warfare method was, as we will see, undoubtedly adopted from the steppe nomads who had perfected it centuries earlier. We will discuss this innovation, and some things related to it, in

section 2.1. The conscript armies were armed with a large array of bronze weaponry, ranging from spears and dagger-axes to swords; at the time, bronze metallurgy had reached its technological apex. But the period also saw the advent of the Iron Age. Iron soon proved to be a superior material to bronze in many ways, triggering a slow but steady replacement of bronze with iron weaponry. The origin of iron metallurgy and related issues will be discussed in section 2.2., below.

2.1. On Horseback into Battle

While most scholars more or less agree upon the rough time and area of the first domestication of the horse, there is still some controversy about when riding first started. On the grounds of archaeological data, we know that the horse was first domesticated on the Pontic-Caspian steppes around 4800 BC (Anthony 2007: 201). Originally the horse, like most domestic animals, was kept for its meat; it gradually replaced bovines as the preferred domestic animal on the steppes as the climate changed around the time and the horse was better adapted to colder and drier conditions. It was probably not for another millennium or longer before man recognized the horse's potential for transport.

Many, Anthony (2007: 221) most recently, argue that man must have started to ride horses almost as soon as he kept them in herds: "Over the long term it would have been very difficult to manage horse herds without riding them. […] Riding began in the Pontic-Caspian steppes before 3700 BCE, […]. It may well have started before 4200 BCE." The popular thought is that people living in close relationship with horses would quickly have gotten so familiar with them that they would naturally have learned how to ride them. Anthony's findings seem to support the theory of such an early origin of riding: The teeth of some horses excavated at a site in the Kazakh steppes dated to 3700 – 3500 BC exhibit clear signs of bit-wear (Anthony 2007: 219).

However, the thought that riding would come naturally for people living around horses is based on modern conceptions of riding; man's first experiences with horses must not necessarily have been similar. In more recent history, some Native American tribes were able to learn how to ride very quickly and also became adept at riding with very few appliances, but one should not forget that they had the European settlers' example of good riding to learn from (Drews 2004: 86). In addition, the horses they first came into contact with were not

wild, but the descendants of already domesticated horses. The Chinese were in a similar situation when they first started riding: Their horses, being of domesticated stock, were already familiar with people, and they had horse-riding communities nearby to learn from. The earliest riders had no such basis to depart from – they were on uncharted territories with their first experiments, and trying to sit on an animal as ferocious and unpredictable as their still half-wild horses would probably not have seemed very attractive. Man started riding on other animals, donkeys or oxen; early depictions of the use of nose-rings – a typical method of control for donkeys or oxen, but less than ideal for controlling a horse – for horseback-riding seem to indicate that the usefulness of such a "moving seat" directly inspired the early riders to try their luck with horses.

Drews refutes the argument that horse-riding would have been necessary for keeping horses in herds by pointing out these well-adapted and resilient animals would have been able to forage for themselves and could have been kept close to a settlement by very easy means, like tethering the foals (Drews 2004: 23). The earliest riders would have been brave and daring men who undertook it as a sport, a show of their prowess to impress others; but riding as an earnest activity probably did not start before the end of the 2nd millennium BC. The skills necessary to successfully ride a horse are very much different from simply sitting on the back of a donkey or oxen, and essentially far more complicated. Even after the nose-rings were abandoned, the early bits and bridles did not represent a reliable method to control horses, as the commonly used organic materials like rope and leather were chewed through easily. This would lead to the dangerous and potentially life-threatening situation of a rider completely losing control over his mount, as the early riders had little experience with the training of horses and had to rely mainly on tactile control through the bridle. This seems to be supported by the fact that early depictions of riders always show them seated very far backwards towards or even on the croup of the horse, which seems counter-intuitive to a modern rider, but would have made sense as a position from which to easily eject oneself from the back of a horse gone out of control.

Drews therefore argues that horseback-riding only started being practiced in earnest after the invention of bronze mouthpieces around the beginning of the 1st millennium BC, which were impossible to chew through and therefore allowed for secure control over the mount for the first time. In any case, there is evidence that horseback riding only became wide-

spread after the 1st millennium BC, around which time bronze mouthpieces appear with increased frequency. Also around the same time, horsemen start to be depicted sitting farther forward on the horse; as the rider did not have to fear losing control over the horse any minute, he could dare abandoning safety for a better, more effective seat (Drews 2004: 86).

Anthony's and Drews' interpretations of the available facts do not contradict each other; early findings of bit wear on horses, if their dating is reliable, can be explained by mankind's first experiments with riding – in areas where they precede the advent of wheeled transport – or else, driving. But only after having gained secure control over the horse by means of the bronze bit, riding became widespread. Instantly after, man seems to have become better at riding and training the horse rapidly. Cavalry warfare started being practiced around the beginning of the 1st millennium BC, i.e. around the same time hard metal bits appear; on this most scholars agree, including Drews and Anthony (Anthony 2007: 223; Drews 2004: 71; Bokovenko 2000: 304). Not only was excellent control over the horse a necessary prerequisite to effectively enter battle from horseback, the rider also needed weapons suitable for the endeavor. Before the 1st millennium BC, bows were far too long and cumbersome and could not be shot from a sitting position, let alone from horseback. Only with the invention of the short recurve bow around that time could mounted combat become effective (Anthony 2007: 223-4); in fact, if horse-riding started being widely practiced around the 1st millennium, it might even have spurred on the development of this weapon. In a converse argument, the mounted warriors' expert use of this bow in mounted combat also testifies to their refinement of riding skills and the complete control they now exerted over their mounts; they had to be able to control their horse with their legs, weight shifts and voice commands only, while they let go of their reins to draw their bows.

The turn of the first millennium BC also saw the advent of the horse-mounted, fully nomadic form of pastoralism, a form of subsistence that quickly came to dominate the Eurasian steppes (Drews 2004: 27). The Scythians were among the first people to practice it, as we have seen in Chapter 1; we know now that the Asian Scythians, called Saka or Sai, were the ones who brought this lifestyle to the Tarim basin. It clearly arrived there at the same time as they did, between the 9th and 8th centuries BC, and quickly spread throughout the eastern steppes. It was the first time horseback-riding appeared in the area, as well; as we have seen the domesticated horse reached the Tarim basin and early China together with the war cha-

riot, but there are no indications of riding being practiced before the arrival of the Scythians. At the time of their migration into the area, they clearly were already experts not only at riding, but also at shooting their composite bows from the back of their horses. It seems that what they brought to the eastern steppes was not just horseback riding, or the nomadic economy; they were the transmitters of a complete "package" based on horse-riding, including the horseback-centered form of subsistence and successful cavalry warfare methods. Below, we will see these and other possible components of this package in greater detail.

We have now identified the direction from which horseback-riding would have reached early China and the carriers of this innovation; also, we've seen what a complicated development not only of material – as in the bitted bridle – but also of skills must have preceded the effective employment of this technique. The unique combination of complex factors involved in the arrival of horseback riding in China already sufficiently identifies it as foreign in origin. Also, if the technique of riding horses came to China from the steppes, it seems likely that it would have been adopted as the warfare method which the Scythian nomads had already perfected. To answer the questions of when, where, and under what circumstances horseback-riding first started to be practiced in China, and if and how it was adopted from the steppes, we first have to look at some data.

2.1.1. Coeval Documents and Records

In Sinological scholarship it is common practice to turn to ancient Chinese texts whenever a historical question arises. This of course faces some problems and limitations, which unfortunately often are ignored or at least underestimated. The most extensive and useful historiography of those times is the *Shiji*, written and compiled by Han court historians 司馬談 Sīmǎ Tán and, prominently, his son 司馬遷 Sīmǎ Qiān who died around 145 BC (Benjamin 2000: 108). It contains historical accounts, mostly biographies and histories of dynasties, important families, and eminent persons, spanning over roughly 2000 years from the legendary Yellow Emperor up to the authors' times. Sima Qian was a diligent scholar who often cited his sources that consisted of historiographical material from historians of preceding dynasties and kingdoms, but – probably partly due to the mass destruction of many documents under the reign of Qin Shihuang – he nevertheless had to rely mainly on just a few records. In many places, he supplemented missing information with popular romance and legend in order to form a coherent story (Watson 1993: 3-5). In addition to this, it must be

said that Sima Qian had to act in the tradition of historians before him, in trying to downplay the achievements of previous dynasties to ascertain that the Mandate of Heaven rested with the current one; and he was an ardent supporter of Confucian and Daoist thought, something which probably becomes most evident when looking at his depiction of the Legalist Qin state and empire as the model for an evil, corrupted system. His work therefore not only represents his own interpretations of what happened at certain events and concoctions constructed from the accounts of earlier historians and popular legend, his political and philosophical views also have to be taken into account when trying to get an unbiased view of the things he recounts. An additional problem is presented by the fact that the oldest surviving version of the *Shiji* dates to a few centuries later, the 5th or 6th century AD. Unfortunately, no critical edition has been done so far.

Most or all of the above limitations are shared by other texts of the period; so with all these in mind, we can turn to the material concerning our question of how and when horseback-riding arrived in early China. In any scholarship concerned with this question, one passage from the *Shiji* is almost invariably cited. It is a passage from the history of the Zhao kingdom, an anecdotal account of a debate about the adoption of *Hu*-style dress:

十九年春正月，大朝信宮。[…]
召樓緩謀曰：「我先王因世之變，以長南籓之地，[…] 而功未遂。今中山在我腹心，北有燕，東有胡，西有林胡、樓煩、秦、韓之邊，而無彊兵之救，是亡社稷，奈何？夫有高世之名，必有遺俗之累。吾欲胡服。」
樓緩曰：「善。」群臣皆不欲。
於是肥義侍，王曰：「簡、襄主之烈，計胡、翟之利。[…] 今吾欲繼襄主之跡，開於胡、翟之鄉，… 。[…] 夫有高世之功者，負遺俗之累；有獨智之慮者，任驁民之怨。今吾將胡服騎射以教百姓，而世必議寡人，奈何？」
肥義曰：「臣聞疑事無功，疑行無名。[…] 則王何疑焉。」
王曰：「吾不疑胡服也，吾恐天下笑我也。[…] 世有順我者，胡服之功未可知也。雖驅世以笑我，胡地中山吾必有之。」於是遂胡服矣。(*Shiji*: juàn 43)

In the first month of spring in the 19th year (307 BC) [King Wu-ling] held plenary court in the palace of Xin. […] He summoned Lou Huan and said to him: "My predecessor, the king, profited from changes he introduced during his times to expand his territories towards the south, […] but his work was left incomplete. Now Zhongshan is at our stomach and heart, in the north is Yan, in the east are the Hu, in the west are our frontiers with the Lin Hu, Lou Fan, Qin, and Hann; and as we have no valiant soldiers to defend us, this will be the death of our country. What is to be done? A man whose fame should transcend the epochs is burdened by inherited customs. I wish to adopt Hu clothing."
Luo Huan agreed. The assembled ministers [however] did not.
Then, with Fei Yi by his side, the king said: "The merits of the sovereigns Qian and Xiang were their plans to assure themselves of the advantage of [conquering the] Hu and the Di. […] Now I wish to follow in the footsteps of the sovereigns Qian and Xiang and open

up the territories of the Hu and Di for me. […] A man whose achievements should transcend the epochs is defeated by the burden of ancient customs; the man whose thoughts contain singular wisdom is exposed to insolent people's hate. Now I propose to adopt Hu clothing and mounted archery and teach their uses to the common people, but the world criticizes me. What is to be done?"
Fei Yi answered: "I have heard that the one who hesitates in his undertakings does not achieve glory, and who hesitates in his actions doesn't get fame. […] So, oh king, why do you hesitate?"
The king said: "I do not hesitate to adopt Hu clothing, but I fear the world will laugh at me. […] If, in this epoch, there are those who will follow me, the benefits of adopting Hu clothing cannot be known. Even if I draw the laughter of this epoch, the Hu territories and Zhongshan will still belong to me."
Thereupon he adopted Hu clothing.[5]

The king then bids his uncle to don nomad garments, who politely refuses on basis of fearing a breach with ancient rites and customs. The king admonishes him – and in the end succeeds in convincing him:

「夫服者，所以便用也；禮者，所以便事也。[…]吾國東有河、薄洛之水，與齊、中山同之，東有燕、東胡之境，而西有樓煩、秦、韓之邊，今無騎射之備。[…] 變服騎射，以備燕、三胡、秦、韓之邊。[…] (*Shiji*: juàn 43)

It is a fact that the clothing must be appropriate to its uses; the rites must be adapted to circumstances. […] In the east of our country there are the waters of the He and the Bo Luo which we share with Qi and Zhongshan; in the east are also the borders with Yan and the Dong Hu, and in the west we are bordered by the Lou Fan, Qin and Hann, but we do not have the protection of mounted archers. […] Changing to Hu clothing and mounted archery is to protect our borders against Yan, the three Hu, Qin, and Hann. […]

The reform 趙武靈王 King Wǔ-líng of Zhao enforces in the course of this debate is often abbreviated to 胡服騎射 *Húfú qíshè*: '*Hu* clothing and mounted archery'. In the above excerpts most of the moralizing speeches have been cut in order to emphasize the parts explicitly concerned with the adoption of foreign cultural items and the reasons for their adoption; nevertheless, it is plainly visible that the general focus of the *Shiji* is not on the innovation in itself. In the text, "*Hu* clothing" is used almost all the time to refer to the changes planned by the king and seems to act as some sort of stand-in for the whole reform, even though it must be assumed that this was not the essential part. The passage emphasizes Confucian morals, like filial piety (obeying your elders and sovereign) and acting for the greater good, and also gives reasons to justify the rejection of ancient customs in favor of useful new things; it very clearly exhibits some of Sima Qian's moral views. Despite this, the

[5] The English translation was produced by the author with the help of the French translation by Edouard Chavannes (1967 Vl. 5: 69-84).

account is usually taken as the decisive source to answer the question when cavalry first arrived in China: Zhao, so it seems, was the first state in China to adopt a cavalry division into their army in 307 BC. The reason for the adoption of cavalry ostensibly was to oppose nomad incursions, but also to protect Zhao's borders from its Chinese opponents (e.g. Wang and Dai 2005: 20). However, this warrants discussion.

Even though the outstanding part of the king's reform seems to have been the adoption of nomad-style clothing, it is clear that having cavalry was his actual objective. He seems to be very much impressed by the technique of horseback archery, so much that he is convinced having mounted archers will solve his problems on the borders of the kingdom. But for all that the adoption of cavalry is supposed to help protect Zhao's frontiers, the stark focus on clothing is somewhat surprising. It does make sense, however, if one regards the passage as being meant to convey a moral lesson. The officials at court do not oppose the king's idea of setting up a cavalry unit per se, they just object to having to abandon their honorary robes in order to dress in odd foreign clothing, and to abandoning the established rites and customs of their forefathers. The fact that the text focuses on the king's attempts to persuade his subjects of the necessity of this change for the greater good of the country and on him emphasizing filial piety and other moral directives strongly points to Sima Qian using this account to teach a lesson to his readers.

However, if we take the essential information of the passage, i.e. Zhao Wu-ling setting up a cavalry division in or around 307 BC, there might still be some clues we can take from it. One is that it does seem to have been the first time Zhao used cavalry; the king emphasizes that there are no mounted archers to protect his borders, and mounted archery is, as we have seen, the only effective way of cavalry warfare at this time, if one takes into account the lack of suitable weaponry and horse tack. However, this does not mean other states might not have adopted cavalry before, or around the same time; indeed, at least Qin and Yan, frontier states themselves, would probably have done so. Some scholars argue that Zhao apparently did not gain any advantage over their opponents by adopting cavalry, and see this as a sign that these opponents also set up cavalry divisions around the same time. We will discuss the possible advantages Zhao gained through the *Hufu qishe* reform and the general importance and effectiveness of early cavalry in Chapter 3.

Many (e.g. Bai 2006: 136) argue that Wu-ling's campaign was obviously aimed at protecting his borders from nomad incursions and securing his flanks in order to being able to concentrate on his Chinese opponents. Frontier raids probably were an actual problem, but it must also be taken into account that the nomads, at that time, were no serious threat for any of the Warring States. The main reason why pragmatic King Zhao was pushing the reform therefore had much more to do with him wanting to gain an advantage over his Chinese rivals, who indeed were a much bigger threat to him than the nomads could ever be (DiCosmo 1999: 960-1). If these rival states were adopting cavalry units around the same time, he might just have tried to keep ahead in the arms race. The passage itself does reveal that this reform was aimed at strengthening Zhao against all its enemies, and not just to oppose nomad attacks. In addition, it is clearly visible that the king's goals, like completing the conquests of his predecessors, are hardly defensive in nature and center around aggressive expansion (DiCosmo 1999: 134).

Another item in the above passage that is probably at least partly based on genuine facts is the officials' reluctance to don foreign clothing. The ancient rites and the robes were the regalia of the ruling elite at the time, and it must be assumed abandoning these must have been painful for them. This lends some credibility to the notion that horse-riding was not practiced in Zhao at this time, and the same restrictions were probably true for other states. Chariots were still widely in use and were most likely regarded as the dignified way to move around, as opposed to straddling the back of a horse. But the common folk might not have had those kinds of objections against trousers or riding, and could well have started riding horses before that time. The only thing that speaks against this thought is the lack of horses; the animals were still a luxury in China, precious stock that belonged to the elite. They would have been almost exclusively used for pulling chariots, or so archaeological data would make it seem: the animals are found commonly in burials together with the vehicles. The common folk would have owned donkeys and oxen, but no horses, and would therefore not have undertaken any horse-riding experiments either.

Some (Ames and Lau 2003: 32; Goodrich [C. S.] 1984: 304) think that cavalry must have arrived in China at least a few decades prior to the "official" date of 307 BC; the above debate, if the date is accurate and if it can be assumed that it is based on actual events, would not necessarily contradict this; there could well have been bands of mounted warriors of Central

Eurasian origin employed in one state or the other, who would not qualify as “Chinese cavalry”. Indeed, there are other passages in ancient texts dated earlier than the above that mention cavalry. The following passage is from the 吳子*Wú Zǐ*, written by 吳起 Wú Qǐ who, according to his biography in the *Shiji*, lived between ca. 440 and 361 BC.

起對曰：「臣聞人有短長，氣有盛衰。君試無功者五萬人，臣請率以當之，脫其不勝，取笑於諸侯，失權於天下矣。今使一死賊伏於曠野，千人追之，莫不梟視狼顧，何者？恐其暴起而害己也。是以一人投命，足懼千夫。今臣以五萬之眾而為一死賊，率以討之，固難敵矣。於是武侯從之。兼車五百乘，騎三千匹，而破秦五十 萬眾。此勵士之功也。」
先戰一日吳起令三軍曰：「諸吏士當從受敵車騎與徒。若車不得車，騎不得騎，徒不得徒，雖破軍皆無功。」故戰之日，其令不煩，而威震天下。(Zhongguo Guoxue Wang 2006)

Wu Qi replied: "I have heard that men have strengths and weaknesses, that their *qi* flourishes and ebbs. If your lordship is willing to test fifty thousand previously undistinguished men, I would like to lead them to engage the enemy. If Qin is not victorious, it will be laughed at by the feudal lords and lose the balance of authority over the world. Now if there is a murderous villain hidden in the woods, even though one thousand men pursue him they all look around like owls and glance about like wolves. Why? They are afraid that violence will erupt and harm them personally. Thus one man oblivious to life and death can frighten one thousand. Now if I can take a mass of fifty thousand and turn them into a single murderous villain, leading them to punish Qin, we will surely make it difficult for the enemy!"

Thereupon Marquis Wu assented to his plan, granting him another five hundred strong chariots and three thousand cavalry. They destroyed Qin's five-hundred-thousand-man army as a result of this policy to encourage the officers.
The day before the battle Wu Qi spoke to the Three Armies: "All the aides and officers must confront, follow, and capture the enemy’s chariots, cavalry, and infantry. If the chariots do not make prisoners of the enemy’s chariots, the cavalry does not make prisoners of the enemy's cavalry, and the infantry does not make prisoners of the enemy's infantry, then even if we forge an overwhelming victory no one will be credited with any achievements." Thus on the day of the battle his orders were not onerous, but his awesomeness shook the world. (Sawyer 1993, 224)

Cavalry is mentioned several times in the *Wu Zi*, the passage above is only one of these instances. While the core of the text was compiled by Wu Qi himself, it was later expanded and revised by his disciples, and in its present form probably dates back only to the Han dynasty (Sawyer 1993: 192). With the original version seemingly lost and the latest extant copy of the text dating to the Song dynasty, the problems are similar to the ones with the *Shiji*.

The passage above and the mentions of cavalry elsewhere in the same text seem to point to an earlier date of arrival for cavalry in China. Armies in Wu Qi’s times are reported to have had sizeable cavalry that they pitched against each other in battle. However, if the present form of the text dates even as far back as the Han dynasty, it is still not from Wu Qi’s times,

and might have been changed or expanded on by his students and successors significantly. For example, the *Wu Zi* lessons about how to tend to horses and their gear might earlier just have been intended for chariot horses and later been expanded to include cavalry, while the core message would have largely stayed the same. A later editor would have added information regarding parts of the army that had by his time become essential in order to complete the work of Wu Qi.

Similar information is to be found in passages from the 孫子兵法 *Sūn Zǐ Bīngfǎ*, a text that is commonly ascribed to 孫武 Sūn Wǔ. The passages in question do not belong to the core *Sun Zi*, which does not mention cavalry at any point, and seem to have been added later (Ames and Lau 2003: 33). For this reason, Ames and Lau argue that the passages have been wrongly ascribed to Sun Wu and most likely belong to the 孫臏兵法 *Sūn Bìn Bīngfǎ*, a text that had been considered lost for two thousand years until its rediscovery in a Han dynasty tomb in 1972 (Ye 2011: 5). One of the passages that mention cavalry is an explicit discussion of the "ten advantages of using cavalry". The *Sun Bin Bingfa*, if composed by Sun Bin himself, would date to sometime before 316 BC, but again the text we have today dates from the Han dynasty, centuries removed from the original, and so cannot be taken into account without a certain amount of caution.

Ames and Lau (2003: 33) try to make sense of the fact that cavalry is mentioned this often in a text dated so early by proposing that cavalry was adopted a few decades earlier than the discussion from the Zhao court suggests, in the middle of the 4th century BC. Another suggestion they make is to separate the historical Sun Bin from the authorship of the text, and date the text to a few decades later, in the 3rd century BC, at which time larger cavalry divisions could already have existed. The *Sun Bin Bingfa* was most likely a product of multiple authorship, like the *Wu Zi* above, and the successors of Sun Bin might well have been adding to it over many generations; one thing that points to this is the use of the honorific Sun Zi 'Master Sun' throughout the text. The passages that mention large numbers of cavalry could then have been added at a much later date, and would not push the date for the adoption of cavalry backwards at all.

So, as we have seen, the use of historiographical and philosophical writings of the period is fraught with pitfalls and doubts that cannot be safely disregarded. If we are to assume that

the passages mentioned have been written around the times to which they are commonly dated, they point to a date of introduction for cavalry into China of roughly between 350 and 300 BC. They do not help in trying to figure out the first adoption of horseback riding; but it certainly seems likely the Chinese adopted horseback riding directly as a warfare method, and did not ride before, or at least not commonly. We will see later that the rough time of adoption suggested by the historical texts is more accurate than one would assume after this evaluation; fortunately, we do not have to rely on them alone. In the next part, we will examine some of the archaeological evidence.

2.1.2. Archaeological Considerations

Pictorial evidence

If an activity like horse-back riding arrived and became popular at some point in early Chinese history, it must have left some traces in the art of the period. When looking at early Chinese depictions of horse-riding in archaeological records, according to C. S. Goodrich (1984, 282) two objects stand out. One is a lacquered box excavated at Changsha, the capital of Chu, depicting a person mounted on a horse that is clearly outfitted with a bridle and some kind of straps that could indicate the presence of a saddle or saddle pad; it is dated to the Warring States period. (Figure 1) The reins even seem to be connected to something resembling cheek-pieces – we will discuss this part of the bridle below. The second item, probably from about the same time, is an inlaid mirror depicting a mounted warrior attacking an animal with a short sword (Goodrich [C. S.] 1984: 282).

Figure 1: Motive on a lacquered box excavated at Changsha (Chu), dated to the Warring States Period

These objects, and similar ones that might since have been discovered, must be of some importance in telling us when riding started to be practiced more widely in ancient China – at least to an extent that would have artists take note of it. However, they are not dated very precisely. Also, the earliest items might well have been of outside origin; with the amount of trade and exchange that was continuous throughout history, any number of items

could have entered China from the outside. There is no way of telling, in this survey, whether these items were manufactured in China or imported. The tentative dates of the items do point to the same period of time as the textual records.

Horses in burials

The archaeologist's approach to the question of when horseback-riding became popular would involve looking at excavations where horse remains have been found. While chariot horses were buried with chariots in earlier times, horses would be buried without the vehicles after horseback-riding eventually pushed them off the battlefields. However, chariots did not go out of use immediately with the advent of riding and continued to be a sign of power, wealth and influence well through the Qin dynasty – as is illustrated by the chariots in Qin Shihuang's tomb – and as such would certainly have been displayed in a burial. For several centuries both chariot horses and cavalry horses were being used in China, although the number of horses in general must have increased with the adoption of horseback-riding. An increase in the frequency of chariot-less burials might help in indicating the popularization of horseback-riding, but cannot pinpoint its earliest use in China.

It has often been argued that riding-horses need to be bigger and stronger than chariot horses (e.g. Creel 1965: 655); therefore a survey of the relative sizes of horses found in burials from certain periods might be of interest. The common argument is that the Chinese chariot horses would not have made suitable cavalry mounts due to their relatively small size, and that an increase in height, whether by selective breeding or the importation of better stock from the steppes, would have been necessary in order to generate horses able to carry an armed and armored warrior (Creel 1965: 655). It has even been argued that the advent of taller horses spawned the invention of riding (Downs 1961: 1200), which would put additional importance to the fact that the Chinese stock was rather small. Elsewhere it has been suggested that those smaller indigenous horses might have been domesticated by the Chinese for non-military purposes (Olsen 1988: 173); however, there is absolutely no evidence for this, or for the early pre-Chinese cultures making any use of the native horses beyond hunting them for meat.

However, the Chinese chariot horses were between 13 and 14 hands tall and while this might not be a particularly notable size for a modern horse, it is not much less than the

height of an Arabian or Morgan horse, both popular riding breeds even today. Furthermore, a horse's size is not as closely tied to how much it can carry as one might surmise; its general build is more important, which is also well illustrated by many modern-day pony breeds (Drews 2004: 81). While there were significantly taller horses found at the Pazyryk burials, a site attributed to the Scythians (Hyland 2003: 29), the steppe horses generally were still smaller than above-mentioned modern horse breeds, to the extent that they are often called "ponies" in the literature. Some of the taller steppe horses might have found their way to pre-imperial China well before the start of riding, however; the argument does not take into account that taller horses might have been imported and bred for the use of pulling chariots, as well. Still, it is possible that a noticeable increase in the average size of horses might be visible in China after the adoption of riding.

While Anthony (2007) tried to assess the advent of horseback-riding in general by looking at bit wear on horses' teeth, this same approach is of no help in answering the question when horseback-riding came to China; in the former case, some horse teeth with bit marks could be dated to before the advent of the wheeled vehicles in the same area, which means they were undoubtedly ridden, not driven (Drews 1989: 109). But as the Chinese had chariots for about a millennium before they started riding, bit wear must be found in abundance, and there is no variation in the wear between horses driven and horses ridden, as it is caused by the horse actively chewing the bit and not by any outside factors.

It might be of some help to look at the frequency with which bronze bits appear in burials; if Drews is right about riding only starting in earnest after the invention of the bronze bit, it might be something that was adopted by the Chinese along with it. The scope of this work does not allow for a detailed assessment of the archaeological data, but at a superficial glance bronze bits do seem to appear with greater frequency during the Eastern Zhou period, in particular in the north-western parts of early China (Luoyangshi Wenwu Gongzuodui 2009a, 2009b; Liu and Zhu 1981). This strongly points to the introduction of the bronze bit from the steppes; however, the finds dated to the Spring and Autumn period suggest a much earlier date of introduction for the bits than we have so far seen for riding. It is much more likely that bronze bits arrived in China before horse-riding; the bits would of course have been of great help in increasing the control over chariot horses as well and would have been an important asset. At this point, the Chinese would of course have been perfectly capable

of producing their own bronze bits, with bronze technology thriving around the time; but some evidence points to at least some influence from the steppes, as we will see.

Even if bits cannot help in determining the first arrival of horse-riding, some pieces exhibit strong steppe influences and clearly show some form of transmission from the steppe nomads. C. S. Goodrich (1984: 295) noticed the similarity of the design of some cheek-bars found in China to the design of the same parts found in steppe burials. In Figure 2, we see the pieces on a terracotta horse from the tomb of Qin Shihuang[6]; for comparison, a similar model found on several horses from the Pazyryk burials can be seen in Figure 3.[7] The similarity between these artifacts is striking; clearly, this S-shaped design, if nothing else, seems to be a contribution from the steppe people. The function of this part of the bridle, that appears to have been commonly used throughout the Central Eurasian steppes from around the same time as bronze bits, is to provide lateral pressure upon drawing the reins and thereby facilitate turning the horse's head into the desired direction. Depending on the construction and design of this piece, its effect could be anything from gentle pressure to intense pain; some very cruel examples from around the time clearly underline Drews' theory that early riders faced a great challenge in controlling their mounts and initially preferred severe methods. The S-shaped design seems to be a comparably simple and gentle version. Apparently the Chinese changed from disk-shaped cheek-pieces to the long prong-shape, which has western prototypes made from antler-pieces, at some earlier point in time (Jettmar 1971: 16); this probably means there was some obvious advantage to them. The function of the S-shape is not very clear; it might have been helpful to subject a greater area of the horse's cheek to the pressure, and the lower curve could have acted as an additional reinforcement in applying pressure to the horse's chin (Sidnell 2006: 84), but it might just as well have been a decorative elaboration. Seen from the venue that this piece of horse tack might not have had a very significant impact on the bridle's effectiveness, the fact that it obviously was adopted regardless serves to illustrate how closely the Chinese must have interacted with their neighbors.

[6] There are many similar pieces to be found in burials of the period (see for example Tian 2010: 74, or Zheng 2009: 282 for some straight examples); the example here is used to better illustrate the actual use of the piece.
[7] see Rolle 1980: 64-5 for more examples

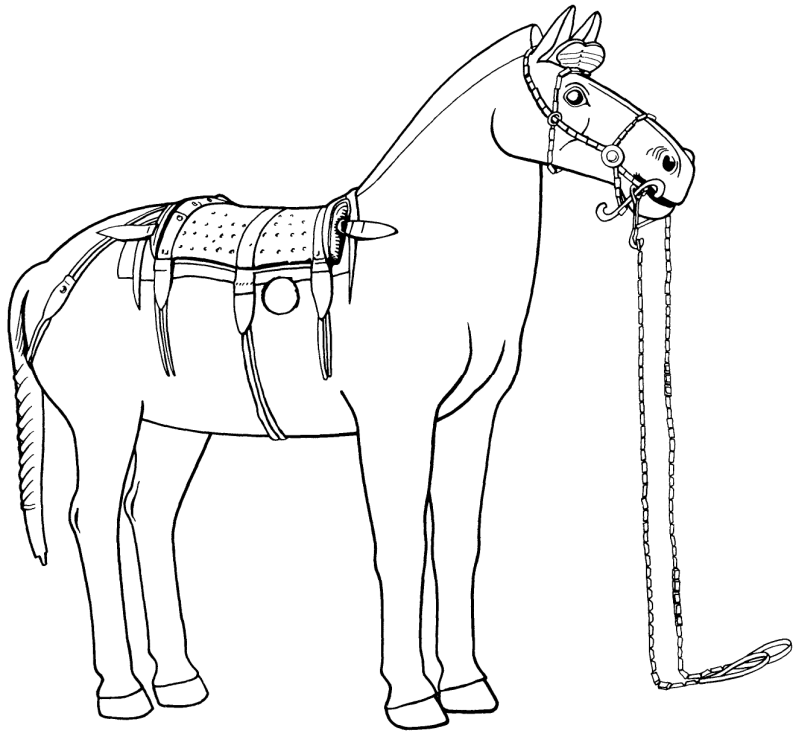

Figure 2: A Qin dynasty war horse from the tomb of Qin Shihuang (221 BC)

Figure 3: A Scythian war horse from the Pazyryk burials (600 BC)

One way to clearly distinguish riding-horses from chariot-horses in burials would be to look for horse tack that is exclusively used for riding; in early times this would have been the saddle. The saddle was an important innovation both for the rider and the horse: Even in its earliest incarnations, when it was barely more than a saddle-cloth attached with a surcingle, it provided some measure of comfort for the rider and eased some of the pressure on the back of the horse, while also eliminating the most serious chafing both on the rider's legs and the horse's flanks. The Scythian saddles found at Pazyryk were constructed of two stuffed cushions held on either side of the horse's spine by wooden bridges (Connolly and van Driel-Murray 1991: 48), which would have helped in evenly distributing the rider's weight to either side of the spine. Although the solid saddle tree and the paired stirrups, both of which would greatly improve the effectiveness of the saddle, were later inventions, these early, basic saddles sufficed to provide a small increase in security for the rider's seat (Dien 1986: 33).

Many have argued that the saddle – in particular with the addition of stirrups – was vital for the development of mounted combat, as it increased the security of the rider's seat to a level that allowed him to put his whole strength as well as the horse's momentum behind a blow or strike. However, as we have seen, the first weapon to be used in mounted warfare was the bow and arrow; no great advantage could be gained for shooting arrows by adding a saddle to the mix. This can be seen in the fact that even after the invention of solid saddle trees and, indeed, even after the advent of stirrups which did provide a significant increase in security, Central Eurasian riders are depicted riding to battle without stirrups or even bareback (Bivar 1972: 282). Even early cavalrymen without a solid-tree saddle were probably very able to deal powerful sword or axe blows from horseback; the example of the Assyrian cavalry shows that stirrups were not necessary even for the effective use of a lance in cavalry charges.

Unfortunately, as saddles were constructed from organic materials like felt, leather, and wood, they seldom survive to show up in archaeological excavations. In any case, as saddles were not vital for mounted combat, the first riders in China might not have used them, and the earliest appearance of a saddle in a Chinese grave cannot be used as proof for the first arrival of riding. But if we look at the fact that the early saddles were not much more than a little padding and hardly meant a great improvement of a cavalryman's performance, its

eventual adoption by the Chinese is all the more significant. It shows that not just the idea or single items were transmitted; rather it seems to point to the introduction of a whole innovation "package".

Despite their reservations and limitations, all of the above – the frequency of bronze bits in excavations, differences in the horses' height, the presence of saddles – would be valuable examinations in order to assess when the Chinese started riding horses with greater frequency. Unfortunately, to the knowledge of this author, these have not been undertaken yet, and the scope and objective of this work does not allow for it. Still, what little archaeological material we have does corroborate the Eastern Zhou Period as the rough time of introduction. Most importantly, it does point to an introduction from the steppes.

What archaeology clearly shows, though, is the gradual eastward spread of riding; there is no doubt that horseback riding was practiced widely throughout the steppes before it surfaced in the early pre-Chinese cultural zone. Considering this, and everything we have seen in the introduction of this chapter, it seems fairly certain that the Chinese would not have developed horseback-riding on their own, even without the passage from the *Shiji* that points to the nomads. Earlier, scholars (e.g. Erkes 1940) confidently argued that the Chinese domesticated horses themselves before they hitched them to their chariots; this has, as we have seen, since been disproved by evidence that was not available back then. But even these scholars agree that the Chinese did not start riding horses before they adopted the technique from the "barbarians" – although this view is always based on the above-mentioned dialogue between king Wu-ling and his advisors alone. Most scholars (e.g. Creel 1965: 656) agree that the Chinese were certainly no horse people; their inability to breed good quality horses in sufficient numbers is exemplified very clearly by the fact that they were always dependent on importing them from the steppes even up to modern times. While it certainly is possible that, as Drew suggested for the earliest riders anywhere, some daring charioteers or grooms started experimenting on horseback for fun purposes, it is certain that they did not consider it an earnest or practical activity before the introduction of cavalry from their foreign neighbors.

2.1.3. A Few Notes on Linguistics

Apart from the information from historiographical accounts and the archaeological data which – although scarce and fragmentary – already serve to paint a coherent picture, there is also linguistic evidence to be considered. The Chinese word for riding, 騎 qí, first appears in texts dated to the Warring States Period, and starts to appear with increasing frequency from then on (Goodrich [C. S.] 1984: 281; Chinese Text Project[8]), which points to its widespread adoption into daily life; this certainly indicates that the activity itself became common at the time. The character consists of "horse 馬 with 奇 phonetic and [is] suggestive of lean on 倚" (Harbaugh 2009: 86). What would be even more interesting, though, is the phonetic reconstruction of the Old Chinese form of the word. The fact that the character only appears around that time seems to indicate that it was created for the sole purpose of referring to this new activity of sitting on a horse that, as we have seen, was most certainly acquired from the neighboring steppe peoples. This strongly points to the possibility of the word being a loanword.

Surprisingly, when looking for reconstructions of the ancient Chinese word for 'to ride', there are almost none to be found in the works that are based on the traditional Chinese method. Except for Karlgren (1957: 19) who, apart from listing a whole array of words describing horses of various coloring, also gives an Archaic Chinese (Zhou Period) reconstruction of *g'ia, there is none in Pulleyblank (1991), who only gives a Middle Chinese reconstruction, or in Baxter (1992) or Schüssler (1987). This is interesting; since ultimately all of their Old Chinese reconstructions rest on the rhymes from the *Book of Odes* (*Shijing*) (Beckwith 2002: 117), which dates back to the mid-first millennium BC, this could mean that a word for riding astride simply did not exist back then, which in turn would confirm that it was a loanword adopted only later. This of course requires closer study. It is possible that other, related words – for example 鞍 ān 'saddle' – were adopted as loanwords as well.

Again, it is obvious that the Chinese not only received ideas or concepts that they copied and complete trade items, but complex techniques or technologies that could not just be reproduced from hearsay or theory, and even loanwords. This shows that the nature of their interactions with their steppe neighbors could not have been simple trade and exchange; it

[8] A search for the word in this exhaustive compendium of ancient Chinese texts serves to show the use of the word in texts dating from the Warring States Period onward, exclusively.

clearly involved portions of steppe peoples migrating into, or later, being absorbed by the Chinese borders, it most probably involved foreigners working for and alongside the Chinese, and it must have involved direct showing and teaching. The latter must have been particularly true for cavalry warfare, i.e. the advanced skill of using a bow and other weaponry from horseback.

2.1.4. Specialized Weaponry for Horseback Combat

As we have seen at the beginning of this chapter, a new weapon was necessary for mounted combat to become effective: the composite recurve bow. While there were very powerful self bows in use from early times, those were easily two meters long or even longer, and could only be drawn while standing upright (Miller et al. 1986: 182). Shortening a bow results in a considerable loss in range and impact; two innovations were necessary in order to circumvent this problem. One was to use a combination of different materials to construct the bow instead of just wood alone: bone, horn, antler, and sinew, all materials with a greater compressive or tensile strength than wood, would be glued together in layers and resulted in bows with up to twice the power of a wooden bow of the same draw weight (Miller et al. 1986: 187). The second innovation concerned the bow shape; while the wooden self bow forms a C when strung, the recurve bow was bent in the rough ξ-shape that would become so iconic for Central Eurasian archers. The tips that curved back at the archer when the bow was strung served to increase the bow's energy storage by forcing the limbs to bend towards the grip (Karpowicz and Selby 2010). In combination, these innovations turn up in form of the Scythian bow around the beginning of the 1st millennium BC; it was considerably shorter than a self bow, with up to 1.2 meters when unstrung, while still possessing respectable range and penetrating power (see Rolle 1980: 72ff).

It is not clear whether these innovations sprang from ingenious engineering or from confluence of outside circumstances; for example, the composite bow has been said to have originated in Central Eurasia because of the lack of suitable wood in the steppes, which led bowyers to revert to easily available materials like horn and sinew. It has also been theorized that the peculiar recurve shape of the Scythian bow was a result of the shape of the horn most commonly used to construct them (Karpowicz and Selby 2010). Whatever the reasons were, the resulting bow ultimately was the source of the unprecedented force and power of the Central Eurasian cavalry.

It is clear that the bow remained the single most effective weapon for mounted combat for a long time; this fact also defined the main tactics in the use of a cavalry force. In these early days, cavalry was invariably light cavalry, i.e. only lightly armored, armed with bow and arrow, and employed not in massed shock combat but in skirmish, raid, and harassing techniques. As this is probably also the form of mounted combat the Chinese adopted for their own armies, the bow must have been of major importance for them. It seems only natural to assume that they adopted the recurve bow alongside horseback-riding.

There are indeed a few museum pieces to be found dating to the Zhou period; short bows of about 1.2 meters in length, with a noticeable recurve (Grosser 1960: 91). However, as bows are constructed from organic materials, they rarely survive burial to show up on archaeological records. Some specimens survived in the arid conditions of Xinjiang: Scythian bows of the type that was used all over Central Eurasia have been found at Subeshi and Yanghai burial sites. Subeshi yielded a specimen that combines the technology of the Scythian bow with materials that suggest some Chinese influences: silk and lacquer (Dwyer 2004). It is dated to 600 BC or later. The bow in Yanghai is of a more typical construction of bone and wood wrapped in sinew and dated to between 1000 and 400 BC (Karpowicz and Selby 2010). The composite recurve bow therefore must have been in use throughout the eastern steppes from at least the 6th century BC, and the combination of materials in the Subeshi specimen clearly shows a technological bridge between the East and the West.

However, bows were used to fight from chariots as well, as it was the only suitable weapon for this purpose at the time (Drews 1989: 86). We have seen that the recurve bow was in use in the steppes adjacent to the Central Plains from at least the 6th century BC, but it is likely that it arrived earlier together with the Scythians. Indeed, the Zhou – who were of Central Eurasian origin – purportedly fought and conquered the Shang using recurved composite bows from their chariots (Kelekna 2009b: 17). A shorter bow would have been of a great advantage for chariot fighting, and the Chinese would probably have adopted it as soon as they came into contact with it; the Zhou might even have been the ones that introduced the weapon to the Central Plains. It is likely, in any case, that the Chinese acquired the recurve bow well before they started riding. This throws up an inevitable question: If the Chinese came into contact with Central Eurasian weaponry early on, why did it take so long for them to adopt horseback riding? The existence of a “buffer zone”, as explained in Chapter 1, can-

not be the reason; many items and technologies were obviously able to traverse this zone quite unimpeded.

It seems that the likeliest scenario is that of the Chinese adopting horseback riding as a complete "package", including riding and the use of the bow from horseback, as well as the bows themselves and various kinds of horse tack. That the bows must have been a borrowing from the nomads probably stands without question. We have seen above that the Chinese explicitly adopted the technique of shooting the bow from horseback and that this required advanced skills of both marksmanship and horsemanship, as well as exceedingly well-trained mounts. The riders that the Chinese come into contact with in the mid-first millennium BC clearly must have been experts; the fact that the Chinese then proceeded to learn this complicated technique strongly points to direct teaching rather than just mere adoption of an idea. Most likely, they learned from mercenaries or other immigrants; we will see below that this is in fact the most common way for innovations to cross over to new areas and cultures.

Even though the bow was the primary weapon of the early cavalryman, he also carried other weapons; in case all his arrows were spent, or the enemy came near enough to engage him into close combat, he had to fall back on secondary weapons. Usually, this would be a sword. It proved a potent weapon to use from horseback; from the elevated position, a rider could deal powerful slashes to an enemy on foot, and it also was the preferred weapon for one-on-one combat with a mounted enemy. The Scythians would carry both a short and a long sword with them in addition to one or two strung bows in their cases (Sinor 1981: 141; Rolle 1980: 75). The Huns later took to wearing matched pairs of a short, single-edged and a long, double-edged sword; it has been suggested that the fact that the Chinese did not take on this custom points to their adopting cavalry warfare from a different group of nomads (Nickel 1973: 142). In any case, Chinese cavalrymen carried a sword as supplementary weapon to the bow as well; in pre-imperial times, it would be a relatively long, straight, double-edged weapon. Before the arrival of the *Dao*-type of sword – a single-edged cavalry saber – in Han times, and the even later use of spear and lance for the purpose, it was the principal cavalry weapon besides the bow (Wang and Dai 2005: 22). Trousdale (1975: 118), in his examination of swords and scabbards, notes that a particular suspension system for scabbards appears in China during the latter half of the 5th century BC, a device that was clearly developed for a certain type of long iron sword. This combination of long sword and its particular suspen-

sion, so he adds, is most practical for use on horseback, as it served to hold the sword at an angle beneficial both for keeping the weapon out of the way and for drawing it quickly when needed. Interestingly, he also suggests that this system was introduced from the horse-riding nomads in the north by the Zhou states, especially Qin. We will return to a discussion of the sword as a weapon of horseback combat in the next chapter, when we look at its origins in China.

To summarize this discussion of the origin of horseback-riding in China, it can be said without a doubt that it was an innovation that was adopted from the steppes. Even though the historiographical accounts have to be treated with care and archaeological data is still scarce, it is evident why it is mostly agreed that horseback-riding must have appeared in China somewhat after 500 BC, but probably several decades before the end of the 4th century BC. It is at this point not possible to say whether horses started being ridden sporadically before the adoption of mounted warfare from the steppe peoples, but what seems certain is that horseback-riding as a serious, widespread activity only started after its adoption for war. It is likely that the first mounted warriors in China were foreign mercenaries – hiring out among foreign people seems to have been a common practice among Central Eurasians (Beckwith 2009: 32) and would account for there being depictions and mentions of riders and riding relatively early. It has been argued, as we have seen in Chapter 1, that the semi-nomadic and settled foreign people on the Chinese borders prevented the Chinese from coming into direct contact with horse-riding nomads until relatively late (~4th century), thereby effectively preventing their adoption of riding; however, the facts that Zhao was able to recruit experienced riders from the frontier peoples at the end of the 4th century BC, and horses were continuously being imported from the Di, suggest that these "intermediate" peoples had been riding for some time (DiCosmo 1999: 950). Also, other innovations like the horse-drawn chariot or, as we have seen, the bronze bit and composite bow, seemingly were able to pass this "buffer zone" unhindered. This may be explained by the fact that this zone must have been much less pronounced at the time of their adoption, the differences in economy and way of subsistence much less sharply defined; it has been argued that the steppes seem to have exerted much greater influence on the very early periods of Chinese civilization (Khazanov and Wink 2001: 13). Still, the question why horse-riding did not diffuse to the Chinese in the same way as the composite bow certainly should be asked. It is possible that sociological and cultural reasons led the Chinese to basically ignore horseback-riding as a useful activity

for what might have been a few hundred years. Foreigners and hired mercenaries would, for a long time, have been the only people mounted on horseback on the Central Plains, while the Chinese people themselves continued valuing the horse as the noble animal that drew their chariots. It might not have been that the Chinese did not know about riding before the crucial date of 307 BC – rather that they did not want it. Eventually, the expansion of the Zhou states into the steppe zone eliminated the above-mentioned "buffer zone" and encroached on nomad territory; for this act of aggression on their new enemies, the nomads, the Chinese required cavalry in order to being able to defeat them on their own grounds. Zhao Wu-ling therefore made the radical decision that his army should include a mounted division, thus allowing this innovation to be forcefully adopted into Chinese culture and society. His emphasis on the need of nomad clothing be worn by not just the cavalry division but his officials makes much more sense in this light: If the nobles and officials were to display this foreign habit, it would help to popularize it among the general public and heighten their acceptance of the adoption of riding. At this point, this is only speculation; hopefully future examinations can throw more light on some of the issues related to the adoption of horseback riding in China.

What we do know, and what is important for this work, is that horseback-riding was transmitted to China from the north-western steppes; that it came along with related innovations of horse-mounted combat; and it is furthermore important to take note of the clues that indicate its direct transmission by people practicing it. We know that horseback riding would go on to gain more and more importance on the Chinese battlefields, where it completely replaced the chariot by the 3rd century BC (Puett 1998: 706); but what role did it really play in the battles of the Warring States? We will address this question in Chapter 3. We have also seen that one of the weapons of horse-mounted combat was the long sword; we will take a closer look at this weapon in the following part.

2.2. Iron Technology and the Sword

2.2.1. The Origin of Iron Metallurgy in China

Arguably the most important innovation of the time, the advent of iron metallurgy during the Warring States period marked the beginning of the end of the Bronze Age in China. This new technology has been credited for contributing to major developments ranging from an

increase in agricultural production, which in turn caused large-scale population growth (Twitchett and Loewe 1986: 578) to causing the collapse of the feudal system (Li and Zheng 2001) and to contributing to Qin's success at the end of the Warring States by providing it with iron swords (Keightley 1976: 32). Whether or not it really had such a shattering impact, the concurrence of this major technological turning point with a period of turmoil and upheaval certainly is striking; it invariably leads to the thought that iron metallurgy might have had some influence in the outcome of these struggles.

The beginnings of metallurgy in China date back to the 3rd millennium BC with early copper artifacts; advanced bronze casting technology was practiced in large scale by the time of the Shang dynasty. The argument about whether bronze metallurgy was developed indigenously or diffused to China from the West is still unresolved today, but many scholars now agree that it reached East Asia and China through Xinjiang (Sagart 1999: 196; An [Zhimin] 1998: 60). From an archaeological point of view this seems very likely, as a rather continuous chronological spread from a center in southwestern Asia can be observed starting from the 4th millennium BC. Metal-working and the use of copper on the Eastern steppes can be dated to the late 4th millennium BC, some time before the earliest findings in the Central Plains (Roberts et al. 2009: 1016). Some theories even connect the advent of bronze metallurgy to the rise of the state in China around this same time (An [Zhimin] 1998: 21).

A similar route of diffusion from a Western Asian center has been suggested for iron metallurgy and is consistent with the dates of the earliest iron artifacts discovered in each region (DiCosmo 1999: 913). The argument over the origin of iron in China is very old, with scholars often being firmly rooted in either the "diffusionist camp", arguing for introduction from the outside, or the "independent invention camp", disagreeing forcefully. The arguments for independent discovery of iron metallurgy were, in the beginning, centered on the perception that there were no noticeable interactions between the early Chinese and any outside cultures. Noel Barnard, a famous "anti-diffusionist", argued against outside origin in various publications (Barnard 1965; 1978; 1983) and in the most recent one combined his extensive knowledge of the archaeological data to that date to conclude that iron smelting was invented in southern China. Using mostly the same data, Donald Wagner, a major authority on iron metallurgy in China, came to the same, tentative conclusion in his extensive monograph on the topic (Wagner 1996: 96). However, most of this conclusion rested on the assumption

that almost all the iron found in China was cast iron, and the first iron items found – and included in publications – to that date seemed to have been cast. Only a short time after publication, new data was published that led Wagner to change his views concerning the earliest use of smelted iron: While a southern origin still seemed likely for *cast* iron, the many newly discovered wrought iron artifacts now made it impossible to ignore the possibility of an outside introduction (Wagner 2008: 105).

Scholars from the PRC are almost invariably found in the anti-diffusionist camp, provided they raise the question of outside versus indigenous origin of iron metallurgy at all.[9] One – seemingly lonely – exception openly laments the fact that his colleagues concentrate on evidence that supports their indigenous theory, even though there already is more than enough archaeological data pointing to outside influences, and proceeds to list much of the same material that has led Wagner to reconsider as well (Tang 1993: 564). While archaeological data always faces certain restrictions, and archaeology in China[10], especially in the Western Regions, is still in its infancy, the evidence for an introduction from the west still seems fairly conclusive at this point. Let us take a look at some of the most important archaeological discoveries.

The first items found in the Central Plain area that are used as evidence for the beginnings of iron metallurgy are several bronze weapons cast around iron blades or edges; mainly 鉞 *yuè* battle-axes dated to the end of the Shang or early Western Zhou dynasty. An analysis of their chemical composition showed that the iron parts of these weapons were forged from meteoritic iron, before having the bronze components cast onto them. It is clear that this technique was not common at the time; rather these weapons were very rare luxury items (Wagner 2008: 99). The fact that they predate the earliest evidence for iron smelting anywhere in China by several centuries also brings up the question where they came from. Barnard (1983: 247) argues that evidence clearly shows that the iron parts entered early China from the west already forged and were then used by Chinese artisans to make these luxury weapons, which exhibit clear local features on their bronze parts. He uses this to support his argument of indigenous development of iron metallurgy, as the introduction of iron items very clearly had no impact at all on the work of Chinese artisans, and did not spawn the dis-

[9] See Chen [Xu] 2010 for an example where the question is not raised at all

[10] For an assessment of the problems with archeological data, see Wagner (2008: 117-212) and Trousdale (1977: 66).

covery of iron smelting or development of an iron industry, therefore apparently having nothing to do with Chinese discovery of cast iron centuries later. However, this argument also supports the theory that China had been in contact with the steppes from very early on and received some useful things through these contacts.

Wagner (2008: 99) on the other hand sees no reason why these meteoritic iron pieces could not have been forged by Chinese artisans, whether they discovered the technique by themselves or learned it from somewhere. Still, their working of small samples of meteoritic iron clearly did not lead the Chinese to discover earth-bound iron resources, which is the first necessary step on the way to develop iron smelting technology. Wagner argues that their early familiarity with the forging of meteoritic iron would have made it easy to develop similar techniques once the existence of iron ore was discovered; Barnard instead uses this fact to underline his view that the "transmission of the germ of an idea" does not work; it obviously needs to be accompanied by all the relevant technological information, even by instruction, for a new technology to be adopted by a culture or society (Barnard 1983: 249).

This, incidentally, is how metallurgy may have spread throughout Eurasia: Not by the "germ of an idea" diffusing to new areas, but rather by being carried by groups of people who migrated to new areas to settle there. From these experts the new technology would then spread to the local people, who would not only learn it but also put their own cultural stamp on the products (Roberts et al. 2009: 1018). The knowledge of iron as an ore that can be smelted might have reached the ancient Chinese cultural zone in this way; but, in theory, it could also have been discovered independently. Smelted iron is sometimes produced in cupola furnaces accidentally when smelting bronze – which might be how it was first discovered in the ancient near East as well – and when its potential as a material was recognized, the resource might have been sought in nature (Wagner 1996). Large deposits of mineral iron are widely distributed throughout China in easily mined forms of ironsand or bog iron, and large outcrops beneath ground as well as above (Golas 1999: 151).

According to Wagner, the prerequisites to produce iron were present in China at the time; the cupola furnaces used to produce bronze could in theory also have been used to smelt iron (Wagner 2008: 113). With temperatures between 1150 and 1300°C, this furnace would have produced liquid cast iron with very high carbon content, but very low in silicon – so-called white cast iron, a very hard, but also extremely brittle material. Its only advantage to

bronze would have been of an economic nature: It was a lot more widely available, therefore a lot cheaper to produce, and thus perfect for agricultural tools and implements for daily use, especially in areas where copper deposits were rare. It would, however, be less than perfect for the production of weapons for obvious reasons (Wagner 1996: 114).

Another possible scenario is that in the attempts to produce liquid metal for casting, faulty operation of the furnace – i.e. at temperatures too low – would result in blocks of low-carbon iron blooms (Golas 1999: 151). With some experimentation, or the experience Chinese artisans might have had with meteoritic iron, it could have been discovered that these blooms can be hammered to remove the slag and thus produce wrought iron, a pliable and resilient material and as such much more useful for weapons; in particular, bladed weapons like daggers and swords. However, the process of producing wrought iron on demand is highly complicated and requires long experience: The temperature needs to be tightly controlled in order to avoid producing cast iron, which would have been useless for a smith (Wagner 2008: 89). Wagner argues that in China, wrought iron started being produced in bloomeries, i.e. small-scale shaft furnaces or hearths that would produce a spongy mass of metallic iron and slag called the 'bloom', which would then indeed be hammered to remove the slag. In order to produce a wrought iron implement, the resulting iron would have to be reheated to a red-hot temperature and then forged with a hammer. This sequence of techniques must be the product of a long development, and while in theory the prerequisites for such a development were present in ancient China, there are a few indications that it happened elsewhere.

From recent archaeological evidence, it is clear that wrought bloomery iron was the first smelted iron that was being used in China (Wagner 2008: 105). The first items clearly made from man-made bloomery iron were found in Sanmenxia, Henan – then the minor state of 虢 Guo, for which there is some evidence that points to ties to the steppes. They are dated to the 9th to 8th centuries BC (827-770 BC) and are found on site together with similar items made from meteoritic iron, which, according to Wagner, might mean that they were wrought by the same artisans; whether local or foreign remains to be determined. In a different state Guo, in Shaanxi further to the west, gold-iron artifacts including three short-swords and a few of the ring-pommeled knives that are considered to be a typical steppe-design (DiCosmo 1999: 893; Linduff 1995: 142) were found to have been made from smelted

iron and dated to the 7th to 6th century BC. Another bronze-iron short sword was excavated from a Qin tomb in Gansu dated to the 8th or 7th century BC, but so far it has not been possible to determine whether it was forged from smelted or meteoritic iron. It can be seen, though, that the first smelted iron pieces were found in the north-western regions of the Chinese cultural area; if the early meteoritic items entered China already completed, as precious trade items and curiosities, these early smelted pieces might have too. Within a short period of time, relations with the north may have brought luxury iron weapons to the south: An iron dagger, presumably wrought, was found in the state of Chu, dating to the 6th century BC.

The first artifacts made from cast iron, on the other hand, have been found in south China, in the areas of the ancient sates of Wu and Chu, dating from the 5th century BC (Wagner 2008: 106). The first block of white cast iron, dated to the late Spring and Autumn period, was found in Luhe County in Jiangsu Province, formerly the state of Wu (He 1983: 392). This indeed ties in with the earlier conclusions of scholars of an iron origin in the south; Wagner concludes that there is no question that cast iron technology was developed in China, and indeed, this technology seems to have spread from there to the West. Still, the data clearly shows that iron smelting in the steppes and the Chinese north-west predated the earliest findings of cast iron in the south (DiCosmo 1999: 913).

The invention of malleable cast iron during the Warring States period transformed cast iron into a much more widely applicable material; thereby cast iron was briefly heated to a red heat followed by slow cooling, a technique called 鑄鐵柔化 or “annealing”, which reduced brittleness and improved the properties of the material to an extent that made it only marginally inferior to steel (Golas 1999; Tang 1993). The production of steel through decarburization of cast iron was also discovered early in this period, as well as the techniques of hardening it through “quenching” – i.e. plunging the red-hot steel into a cooling liquid – and reducing brittleness through “tempering” – i.e. slowly reheating the object to a lower temperature (Golas 1999: 168). Also, production of steel through the carburization of iron blooms was discovered between the 5th or 4th centuries BC (He 1983: 396); all these new developments therefore allowed the production of steel already in the Warring States Period (Liu [Cheng] 2010: 92). All of these innovative methods greatly improved the properties of iron and thus rendered it useful for a much wider array of applications. It is very probable

that these developments were influenced by interactions with the west, although it might not be possible to say to what exact extent.

From the above evidence, it is clear that iron smelting on the Central Plains started with wrought bloomery iron on the north-western peripheries. Did the technology arrive from the steppes? Evidence points towards it. In Xinjiang, iron objects have been excavated from burial sites of clear nomadic origin with radio-carbon dates from around the 1st millennium BC (Kamberi 1998: 808; DiCosmo 2004: 71). Even if these dates may not be exact, the beginning of the Iron Age in the area can be safely dated to at least the 8th century BC. From that century, iron findings are also in evidence from as far east as the Hexi corridor (Wagner 2008: 93). Iron metallurgy gradually gained popularity and it appears frequently in the 8th to 6th century Saka burials in the Xinjiang area, and around the 7th century BC in Mongolia and the north-eastern steppe, which shows a quick spread across the steppe zone. The fact that iron metallurgy was widespread on the steppes before it appeared on the Central Plains does seem to point to Xinjiang as the intermediate link between the western steppes and China, and lends credibility to the theory of diffusion from west to east (Mallory & Mair 2008).

It can therefore be concluded that iron smelting was almost certainly transmitted to China from the west via Xinjiang and the Hexi corridor. There is more than one theory on how and by whom it was transmitted; the most popular one does point to the eastern Scythians as the most likely candidates for distributing iron metallurgy to Xinjiang. Iron metallurgy is regarded as one of the signature parts of the Scythian culture, and although the use of iron for the western Scythians is securely attested only for the 7th century BC, some eastern tribes might have been more advanced (Wagner 2008: 97). In connection with all that we already know about the Scythians from our above discussion, their role in the transmission of iron metallurgy it is certainly a topic of interest.

Linguistics might be able to tell us more about the origin of iron metallurgy. The Chinese word for iron, 鐵 tiě, first appears in the 禹貢 *Tribute of Yu*, a text from the 書經 *Shūjīng*, which is usually dated to the Spring and Autumn period (772 BC - 476 BC); however, it is more likely to be a late Warring States work (Bruce and Brooks 2007). In any case, it can't be dated with any great precision, and therefore it is not regarded as a reliable source (Wagner 2008: 83). The word clearly appears increasingly frequent in texts from the Warring States period, pointing to a gradual assimilation into the culture at the time (Chinese Text

Project).[11] The exact date of when the word entered the Chinese language cannot be determined, but the rough time of its appearance coincides with the first use of iron smelting technology.

The word 'tiě' clearly seems to be related to the color 'black' or 'dark'; this is rather common among other languages as well (Wagner 2008: 87). The reconstruction of the Old Chinese form of the word might be able to give an idea of its origin; however, different scholars arrive at different reconstructions: for example, Sagart (1999: 200) gives *(a)hlik, while Schüssler (1987: 611) arrives at *hlit. Beckwith (2005: 192), using the comparative-historical linguistic method, gives the reconstruction as: *hltèk < *χlèk < earlier *χelèk and notes that it is clearly *the same word* as the hypothetical "Indo-European" *ghelegh. The Chinese word for iron was, and this seems certain, adopted from the outside, and probably with the thing it denoted, as usual. It lends another supporting clue to the above conclusion that iron technology arrived in China from the west.

To summarize the answer to the question when and how iron metallurgy began in China, we can take a look at the conclusion Wagner arrives at:

"The evidence presented thus far suggests that by the -8th century [i.e. 8th century BC] iron-smelting techniques, developed in the West, were being used in parts of Central Asia, and that these techniques diffused to the smiths of the Chinese states by way of various non-Chinese peoples in what is now Xinjiang. The Chinese smiths, now using smelted instead of meteoritic iron, continued to produce luxury articles such as swords and knives, with fittings of gold, jade, and bronze." (Wagner 2008: 102)

To this, it can now be added that these iron-smelting techniques cannot just have "diffused" to the Chinese smiths, but were introduced to them more directly, for example via migrating experts; also, the first iron items might have preceded these experts and entered China in form of fully finished trade products, which would account for their very early but scattered presence on the north-western periphery.

It seems certain that at least some kind of iron technology entered China from the steppes. What we do know from the above survey is that, once again, the connections between early China and the world beyond its borders were much more intimate than often assumed – but they were probably also much more complicated. We know that people migrated into the Chinese territories – the Zhou are a strong example; we know that the Chinese traded with

[11] Again, entering the word as a search term shows clearly that it appears only sporadically in pre-Warring States texts, while it becomes much more frequent in texts dated to the Warring States and later.

non-Chinese people at all times; and we know that the Chinese had a highly developed material culture and were ingenious inventors. Even with extensive archaeological data, which isn't available at this point, it is probably not possible to clearly identify the origin of a single technological innovation; as long as it is not even possible to draw a clear line between "the Chinese" and "the non-Chinese" at these early times, looking for a simple, one-tier answer for these questions of origin does not make sense. The development of a technology was, to all likelihood, a process as complex as the interactions between various groups of people. A strong influence from the steppes was undoubtedly there and can clearly be seen from the archaeological and linguistic evidence; now it will be interesting to look at the possible impact of this influence. We will do this in Chapter 3. First, though, we will take a closer look at the weapon of cavalry warfare we have mentioned above, which is closely related to the arrival of iron technology.

2.2.2. The Sword

As we have seen, it is not quite clear whether iron metallurgy was part of the innovation package that arrived with the Scythians, although it seems likely; but as we have concluded in section 2.1., the sword may very well have been. It is a weapon that is often implied to have a close association with cavalry warfare: as mentioned above, the sword was the close-range weapon of choice for the horse-mounted Scythians; and archaeological findings indicate that they were carrying long, iron swords from at least the 5th century BC (Rolle 1980: 46-7).

The origin of the sword in China has, much like the origin of iron technology, been discussed in two venues. In western scholarship of the early 20th century, it has usually been regarded as an introduced weapon (e.g. Barnard 1965: 187) – however, this was mostly based on textual evidence and a lot of speculation. Chinese scholarship, again, never really raises the question of origin at all and instead seems to focus on procuring very ancient stone "swords" from Shang burials or citing legendary accounts from the *Shiji* to show that swords were used in the times of the Yellow Emperor, thereby trying to underline ancient China's advanced cultural and technological level (e.g. Liang et al. 2011; Xing 2010: 93).

In Chinese material culture, swords basically fall into one of two categories. One type has a single-edged, often slightly curved blade, and is simply called 刀 dāo 'knife', sometimes with

modifiers that expand on its exact function, e.g. 大刀 dà dāo 'saber', 馬刀 mǎ dāo 'cavalry saber', or 斬馬刀 zhǎn mǎ dāo 'horse-chopping saber'. This weapon can be traced back to the common knife and might be derived from it by gradual lengthening. Indeed, the popular ring-pommeled knives we have seen briefly mentioned in section 2.2.1 are single-edged and could be seen as ancestors of this type of sword; they seem to have been part of the Central Eurasian Central Complex (Beckwith 2009: 400-1). These knives are usually considered to be typical steppe weapons, and the later *Dao* saber is commonly regarded as a steppe contribution as well. However, the long cavalry saber only comes into widespread use during the Han dynasty, when it started to replace the double-edged sword as the main cavalry weapon (Liang et al. 2011: 246; Wang and Dai 2005: 22); it is therefore beyond the timeframe treated in this work.

The other type of sword is characterized by a double-edged, straight blade and called 劍 jiàn 'sword'. This weapon has precursors in the form of double-edged daggers as well, and therefore also often is thought to have its origins at least in the Shang dynasty. A continuous lengthening of the double-edged blade is visible throughout the development of history, from the rather primitive stone daggers of the early Shang dynasty to the meter-long, slender iron blades dated to the 3rd century BC. Seen from this venue, why indeed would one look for an outward origin of the sword?

The origin of the *Jiàn* is an interesting puzzle, much of which is connected to the way it has been handled in scholarship. The mere fact that the early stone daggers are straight and double-edged does not justify calling them *Jiàn*. As it turns out, this is a gross anachronism: The word 劍 jiàn only starts appearing rather suddenly in texts dated to the Warring States period (Chinese Text Project)[12] – it does not appear at all in earlier documents, and is not to be found among the characters of the Oracle Bone Inscriptions (OBI). The question that poses itself at this point is, if the *Jiàn*-swords were derived from the earlier daggers by gradual lengthening, why the sudden need to introduce a new word to describe the weapon?

The very fact that the word appears so suddenly suggests that it could be a loanword – it would certainly not be the first one in this survey. In order to figure out whether it was a loanword, and if so, what language it might have come from, we need the Early Old Chinese

[12] Entering the word as a search term produces only results for texts dated to the Warring States Period or later.

reconstruction. There are several reconstructions found in canonical works that use the traditional Chinese method of reconstruction: Schüssler (1987: 297) gives a tentative reconstruction for Early Zhou Chinese as *karjams; Karlgren (1957) only reconstructs as far back as Middle Old Chinese, the language of the *Shijing* rhymes, and arrives at forms like *klịăm – of which a current reconstruction would be *kram, based on simple modernization; and Pulleyblank (1991: 148) stops at Early Middle Chinese with *kɨam^{h}. A modern, linguistic reconstruction by Beckwith (p.c. 04/08/2011; publication forthcoming) produces the Old Chinese dialect forms: *krem- ~ *krew- ~ *kreb- and *kram- ~ *kraw- ~ *krab-. These derive from a hypothetical Early Old Chinese root *kere-w/m/b- ~ *kara-w/m/b- 'sword' (the manner of articulation of the coda is unclear).

If we look at other languages, it quickly becomes clear that the root *kere- ~ *kara- 'sword' has a virtually endless list of cognates in Indo-European languages: e.g. Sanskrit kartana- 'cutting'and kṛti- 'a kind of knife or dagger'; Avestan kərətə- 'knife'; Persian kārd 'knife', and Ossetic kard 'knife' (Adams 1999: 197). All of the above examples are derived from a common Proto-Indo-European root *sker ~ *ker 'to cut' (Mallory and Adams 2006: 143).

Adams (1999: 197) also gives the words for Tokharian A, kāre 'sword', and Tokharian B, kertte 'sword', both of which also obviously derive from the Proto-Indo-European root. The Tokharian A (East Tokharian) word is almost indistinguishable from the reconstructed Early Old Chinese root; it is therefore possible that the origin of the Chinese word for sword can be found here. The Tokharian B (or West Tokharian) word seems to be related more closely to some of the Iranic languages, like Persian and Ossetian; the latter is a North/East Iranian language, a descendant of Scythian. It has been noted before that the Tokharian B word might have been derived from an East Iranian language, even though in that case it was connected with Avestan (Mallory and Mair 2008). If the sword travelled from the west across the steppes like iron metallurgy and horseback riding did, an Iranian source certainly seems probable for the loanword. The most likely scenario is that the Chinese and the Tokharians received both the sword and the word for sword from the Scythians at around the same time, which would accounts for the close similarity of the words.

From the above it is now clear that the Chinese word for sword must be a loanword. Its exact origin aside, one question still remains: Why did the Chinese suddenly feel the need to adopt a foreign word to refer to a weapon which – if it indeed developed from the earlier

daggers through gradual lengthening – they seemed to have already? As loanwords go, its adoption indicates that the *Jiàn*-type sword was a foreign contribution as well and probably arrived together with its name. However, as we have seen, the *Dao*-type sword seems to have been adopted as well, and no new word entered the Chinese language with that innovation. Was there a particular reason for this, or did the Chinese adopt the foreign word jiàn just for the sake of convenience? Or could it be that they indeed received a new type of sword from the steppes, one that was different enough to warrant the adoption of a new word to describe it?

One of the problems in dealing with the question about the origin of the sword in China seems to be that there is no clear definition for a sword; as we've seen above, 'swords', i.e. *Jiàn*, with blade-lengths less than 20 cm and made from stone, are regularly procured from excavations dated to periods well before the word jiàn is attested. However, convention has it that the word "sword" implies a certain use that differs from the use of a dagger or knife; while a dagger is clearly intended for employment at a very close range, mainly for stabbing, a sword is decidedly a cutting and slashing weapon whose effective use requires intensive training. A certain length is required as well: Short swords commonly have a total length of at least 50 cm; a long swords measure up to and above 1 m in length. Not only do the stone weapons from the Shang dynasty predate the arrival of the word jiàn, it is also evident from their length that their function must have been that of a dagger. It is clear that at some point in history, the double-edged weapon must have undergone changes that made it recognizably a sword, not a dagger; was length the decisive turning point?

One of the most famous specimens among the first recognizable swords excavated in China comes from the minor state of 越 Yuè in today's Hunan province. Even though the dating of the weapon to the reign of King Goujian of Yue, that is said to have lasted from 496 to 465 BC (Ebrey 1999: 41), is not entirely solid, the inscription on which it is based clearly identifies it as a *Jiàn*-type sword: "越王 [勾] [践] 自作用劍" which roughly means "Goujian, the king of Yue, made this sword for his personal use" (Zhongguo Wenhua Wang 2004). This weapon is made of bronze and has a total length of 55.6 cm, with a ca. 10 cm long hilt (Sina Science 2004); it seems to be a typical specimen of the type of bronze short sword, measuring between 28.8 and 59 cm, that had started to come into progressively more widespread use since the Western Zhou period, and had become very popular during the Eastern Zhou pe-

riod (Yang [Zemeng] n.d.: 22; Wagner 1996). Many specimens dating to the same period appear in a relatively wide variety of lengths; there is no sudden lengthening of the blade visible around the time of the first appearance of the word jiàn. This might, however, also have been due to a transition period – the mere arrival of a new type of sword would not immediately have displaced the shorter weapons.

If the length of the weapon that came from the steppes was not significantly different from the double-edged weapons in use in China around and before that period, what made it different? Above we have seen that the Scythians may have been the transmitters of iron technology to China; therefore it is possible that the solution lies with the material the weapon was made of. Even though the first iron items appeared long before the Warring States period, all of them are weapons, most of them double-edged swords; it might be that some of these weapons entered China before the word, or the weapon as well as the word took a few centuries to become popularized. Both of these scenarios could explain why iron swords appear on the Central Plains before the word for sword. So it might indeed be that the weapon called jiàn that was transmitted to China was the 'iron sword'; maybe, since iron metallurgy was still not very commonly used at the beginning of the period, they were enough of a novelty to leave behind a loanword. But, as we have seen in the previous paragraph, bronze weapons obviously were referred to as *Jiàn* as well. This might have been due to an extension of meaning; the word that was adopted to mean 'iron sword' was, after some time, used to refer to all weapons of the same shape, i.e. double-edged swords in general. However, it could also mean that the material of the weapon played no role in the adoption of the loanword.

What can be said is that iron does stand in connection with the lengthening of the weapon (Wertime 1980: 518). Bronze is a very durable material and had been in use for weapons for a long time; however, the appearance of a long bronze sword only happens very suddenly *after* the first long iron swords arrive on the scene in the 3rd century BC (Wagner 1996: 195). The probable reason lies in the mechanical properties of bronze, which make the casting of a long blade technically difficult; furthermore, the resulting blade would be liable to break under impact. It is likely that the 3rd century long bronze swords were not used in battle, but were intended for display or burial as ritual weapons, while the iron long swords were the actual weapons. It could also be that swords of that length only became popular this late in

history because of certain requirements in warfare – which leads us to the next possible characteristic of the adopted weapon: the difference might have lain in its *use*.

As we have seen, the Scythians used to carry swords as supplementary weapons for fighting from horseback; if there is one thing that can be said, it's that using a sword from horseback is different from using it on foot. When wielded from horseback against an opponent on foot, it would mainly be used in hacking attacks from above and so would have had the potentiality of causing great damage; against another mounted warrior, it would be used for slashing and parrying much like when two swordsmen met on the ground. In both cases, however, the horse would have forced the fighters to move differently and also have increased the distance the two opponents had to breach in order to attack. Therefore, greater length would definitely have been an asset in a cavalry sword. It could be, then, that the weapon adopted by the Chinese was the 'cavalry sword'; this would account for the word jiàn appearing in the ancient texts so late. The earliest appearance of *Jiàn*-type swords (see the sword of Goujian, above, in the mid-5th century BC) and the date assumed for the adoption of cavalry warfare (mid to end 4th century BC) do not come together very well; but this might have been one of the incidences where one innovation, in this case, the *Jiàn*, was adopted before the other – here cavalry warfare. As we have said above, there were probably some reasons that prevented the Chinese from adopting horseback-riding that had nothing to do with availability or lack of contact; innovations in weaponry carried by Scythian nomads might then have been considered beneficial to adopt long before cavalry warfare.

It might be that a more general difference in use was the crucial factor. Hoffmeyer (1961: 39) writes about a change in the use of swords in Europe: "The change in Central Europe from thrust to cut-and-thrust [swords] possibly took place at the end of the Late Bronze Age or in the transitional period between Late Bronze Age and Early Iron Age, about 1100 B.C." She adds that this probably was an invention of the "charioteering and mounted peoples of Asia Minor" and says elsewhere that the cut-and-thrust sword, as opposed to the thrusting sword mainly used by ancient infantrymen, was unambiguously a cavalry weapon (Hoffmeyer 1961: 37). That this transition took place around the beginning of the Iron Age and around the same time that horseback riding spread throughout Eurasia, is probably no coincidence. Bai (2006: 141) argues that the advent of cavalry warfare in itself caused swords to undergo some changes – most importantly, it developed from a straight-thrust into a "chopping"

weapon. The long *Dao*-type sword, or cavalry saber, would later become the preferred cavalry weapon exactly for its suitability for hacking or chopping attacks. Examples from Western antiquity show a similar division in the use of swords: compare for instance the Roman *gladius* – a short infantry sword – to the *spatha*, a long sword initially employed by cavalry, or the Greek *xiphos* to the *makhaira* or *kopis*. It seems that, generally, a longer sword suitable for hacking and slashing was the preferable weapon for the use from horseback.

The true answer to the question what kind of sword the Chinese adopted along with the loanword jiàn is probably to be found in a combination of all the above. As we have seen, the sword's use as a cavalry weapon would have influenced its length as well as how it was wielded; and its length had an influence on how it was wielded as well as on the preferred material it was made of. Whether the weapon the Chinese adopted was the "long, iron cavalry sword", or one of these innovative factors preceded the others together with the loanword, we cannot say at this point. What we can now state with some confidence is that the word for sword, jiàn, seems to be a loanword from an Indo-European language; and this makes it likely that some innovation connected to the sword was adopted. If the theory of a "Scythian innovation package" is sound, then this iron cavalry sword might actually be a symbol in that it represents a combination of all of the innovations together.

To summarize, Chapter 2 has shown that, while the dearth of reliable archaeological data and the inherent unreliability of ancient texts makes it hard to pinpoint when and how exactly a given innovation might have entered China, there is a lot of evidence that the innovations in question were, at least in part, adopted by the Chinese during the Warring States Period or slightly earlier. The evidence certainly can neither be ignored nor explained away, and can be used to draw a very coherent picture that – while of course remaining somewhat uncertain due to the paucity of archaeological data – is consistent with the historical facts we know about the respective regions and with our initial explanation of the interactions that went on between them.

Whether or not all of the innovations mentioned actually were part of a Scythian "package" of innovations that arrived in the eastern steppes simultaneously and then diffused to the Central Plains via the various steppe-dwelling people in Xinjiang, Gansu and elsewhere, is,

while irrelevant to our question, certainly an interesting question and should be addressed in future scholarly endeavors. What can be said at the end of this chapter is that the Warring States saw a few very important innovations arriving from the steppes. And while these innovations were not, by definition, exclusively of a military nature, we have seen that they must have been adopted for exactly this reason: Horseback-riding does not make an appearance on the Central Plains before cavalry warfare (and the historical sources explicitly say that it was adopted specifically for war), and most of the wrought iron items of the early epoch are swords, or other weapons. In the next chapter we will analyze the importance of these innovations in a time of constant war.

Chapter 3: The Impact of the Steppe Relations on Warring States China

In the previous chapters we have seen that the contacts between the pre-imperial Chinese culture zone and the northern and western steppes not only started earlier and were much busier than commonly acknowledged, they were also much more significant; as exchanges go, these involved benefits on both sides, but Chapter 2 has shown that pre-imperial China profited from these contacts mainly because so many innovations of the time originated in the ancient Near East and were able to diffuse eastwards through the help of migrating people and the trade across ecological borders between nomadic and sedentary peoples. Of course the reverse is true for many innovations that originated in China – one we have mentioned above is cast iron technology, and many more would follow in subsequent centuries.

The innovations that entered China from the steppes are of such a revolutionary nature that it seems likely their impact on the Warring States and their battles and attempts of conquest must have been considerable. It is clear that the arrival of techniques or technologies like horseback riding, iron metallurgy, or swords, which seem so fundamental today and which have been an integral part of human history for several thousand years, must have triggered substantial changes. But what changes were these? How significant were they for Warring States China, the wars and their outcomes? We will try to find answers to these questions in this chapter.

Apart from the arrival of tangible innovations like the ones discussed in Chapter 2, the interactions between the two cultural zones also had other impacts, most prominently on the political, economic and social dynamics of early China. These effects were of a less concrete nature, and had less impact on the actual wars; they were, however, of even greater importance for the political structure and may in fact have helped the progress of the Chinese cultural zone from a feudal kingdom over competing states towards one large centralized empire more than the innovations we have analyzed above. We will discuss how the Warring States profited through close interactions with the steppes other than by acquiring new technologies and skills later on in this chapter.

3.1. The Impact of the Innovations on Warring States China

3.1.1. Iron Metallurgy

As we have just seen in Chapter 2, iron smelting technology came to China from the west via the steppes and its inhabitants; in particular, it seems to have been carried to the edges of Chinese civilization by Scythian migrants, which is suggested by a link in the etymology of the Chinese word for iron. From the premise that an essential technology like iron smelting was carried by steppe inhabitants immediately follows that marginal territories of ancient China, like the states sharing a frontier with the steppes, would have been first in line to receive the innovation. Indeed, we have seen that the first wrought iron items appear in areas in close vicinity to the steppes. From today's perspective it seems that the arrival of a basic technology with such massive historical importance as iron metallurgy must have been a decisive event; if the marginal states of the Warring States Period were indeed able to use this technology before their rival states, they might then have been able to profit from this and gain an advantage over their enemies.

The first question that arises here is whether iron metallurgy indeed was such a groundbreaking innovation at the time of the Warring States. Bronze metallurgy had reached its height in quality, versatility, and production techniques at around this time and therefore bronze weaponry, bronze tools, and bronze decorations were omnipresent. For a people using their advanced bronze technology to the utmost possible level, what advantages would the new iron technology have brought? Did it inspire new uses for metal implements due to its different mechanical properties? How did these mechanical properties of iron compare to bronze? Would the differences have been significant in daily life – or in battle?

Since we have seen that the advent of iron smelting technology at first resulted in wrought iron and only inspired the invention of cast iron a few centuries later, the comparison of mechanical properties will have to be between wrought iron items in contrast to bronze items. For our examination of the Warring States Period, any items that directly played a role in battles and other antagonistic confrontations still are of special interest; and as we have seen, the first wrought iron items are indeed bladed weapons: axes and swords. How did they compare to the axes and swords made of bronze used at the same time?

In Chapter 2 we have seen that the earliest production of iron probably took place in bloomeries which produced an iron bloom for further processing; the resulting wrought iron usually had very low carbon content and would therefore be soft and liable to bend (Wagner 1996: 103). In comparison to bronze, it would not have been a very good material for use in weaponry. While Germanic tribes, for example, used it extensively for their weapons, they used it because of the easy availability of the material, not because it proved better than bronze. It is possible that this factor played a role in early China as well; while copper and tin deposits were certainly available for China in amounts sufficient to develop its thriving bronze culture, iron was in much greater supply and often available in easily accessible form. The properties of the early wrought iron items would, however, not have lent themselves to be considered as a preferable material for weapons. It took the invention (or adoption) of the techniques of annealing and quench-hardening for it to become a better material for weapons than bronze was; in fact, only after the invention of these techniques during the later Warring States Period did bronze weapons gradually go out of use (Wagner 1996: 103).

We have, however, alluded to one advantage besides wide availability of the raw resource that iron had over bronze: As the material was less brittle, a weapon – specifically a bladed one, such as a sword – could be made longer without increasing the danger that it would break under impact. In this, Wagner (1996: 197) sees the major advantage of wrought iron over bronze: Greater length would have increased a warrior's reach and so given him an immediate edge over an opponent wielding a shorter bronze sword. We have seen that the lengthening of the sword may have been related to cavalry warfare, and that these swords were probably carried almost exclusively by mounted soldiers and officers for the reason that they were rather rare. However, a longer sword would have represented an advantage over an opponent with a shorter sword, no matter whether on horse or on foot. In that respect, iron would have proven the superior material to bronze. So, at least where it concerns the length of the weapon, the material properties would definitely have proven superior to bronze.

The question whether iron metallurgy, or more specifically iron swords, would have given specific states an advantage has been posed before. In 1951, Sekino Takeshi (cited in Keightley 1976: 31) offered the hypothesis that Qin's eventual victory was at least partially due to its successful implementation of iron technology; i.e. to its armies being equipped

with wrought iron swords superior to the bronze swords of the other states. A few decades later, Keightley (1976) pondered this hypothesis in his review of Barnard Noel's newly published *Metallurgical Remains of Ancient China*.[13] With the massed armies of the period, Qin would have needed a massive number of swords to equip its soldiers; however, the excavations to that date had not brought to light any significant numbers of the weapon. Keightley therefore asks the question where those swords, if they ever existed, would have disappeared to. In his answering paper, Trousdale (1977: 65-6) argued that the number of iron swords excavated must not necessarily stand in any relation to the number of swords that were in use during the Warring States Period. Iron implements, being of a more utilitarian nature than bronze ones, would have been less likely to get buried in the first place and more likely to end up being endlessly reused and recast; and he concluded that the possibility that Qin had superior iron weaponry is therefore not completely off the table. Finally, Barnard (1978: 63) took up the issue in another paper, in which he concludes on basis of current archaeological data that the superior iron swords of Qin probably never existed. He thinks it likely that only officers and cavalry would have been carrying long swords in the Warring States Period, and that iron swords therefore could not have played any noticeable role in Qin's conquests.

While Takeshi was certain that the superior swords of Qin would have been wrought iron blades due to material properties, it is clear from the meager number of smithy implements brought to light in excavations that this could not have been the case. Any large number of swords would have needed to be mass-produced using cast iron technology. However, it is argued that a warrior wielding a cast iron sword would not have fared well against an enemy with a bronze weapon (Keightley 1976: 33; Trousdale 1977: 65); and we have seen above that this would indeed be likely in the case of the early, white cast iron. It took the invention of malleable cast iron in the 4th to 3rd centuries BC to make iron competitive with bronze; and only then could bladed weapons like swords be mass-produced to any useful end (Wagner 1996; Barnard 1978: 64). Before that time, swords would have been wrought; in either case, evidence for any large number of iron swords being produced and used during the period is very much absent.

[13] Barnard, Noel / Satō, Tamotsu (1975), *Metallurgical remains of ancient China*. Tokyo: Nichiosha

Since the 1970s, the landscape of archaeological data has not changed in that respect, even though China's political opening made much more information available to western researchers. Iron swords, so it seems after everything we've seen, obviously were rare luxury implements until the very end of the Warring States period; no great number of them have been excavated anywhere in China that could be dated to earlier than the late Han dynasty. Of course, there might be reasons that led to iron weaponry ending up in burials less frequently than bronze weaponry – as Trousdale (1977: 65-6) argued. Bronze was considered a beautiful material and used for ritual and decorative purposes, while iron was not and would, at least in the beginning, not be used for such purposes (DiCosmo 1999: 947). This might be visible in the fact that the terracotta warriors in Qin Shihuang's tomb wield bronze swords without exception (*Bingmayong* 1983: 14). By this time, bronze could have been the chosen material only for burial, while in actuality the soldiers carried iron weaponry. However, the fact that the terracotta figurines were sculpted to look exactly like real men and are thought to form an exact representation of the setup of the emperor's army in real life rather points to the material of the swords being accurately represented as well. Iron lances found in the pits also indicate that the decorative and ritual properties of the material were not taken into account in this case. In addition, the figurines that carry swords all seem to be high-ranking officers; this underscores the above argument that swords were an elite affair.

So, at this point it seems that weaponry made from wrought iron as well as from cast iron was not in widespread use throughout the Warring States period and even beyond. Only towards the very end, when the technology had developed far enough for the material properties to become noticeably better, did weapons made from iron become appreciated and also get used more widely; after the invention of certain production and procession methods, iron had finally become superior to bronze not only in availability. At this time, however, iron technology had become equally widespread throughout the Chinese cultural zone, and the new technological improvements probably spread much more quickly. Long, wrought iron swords might have represented an advantage from early on; but as we have seen, they were luxury weapons used by a relatively small number of persons. It is therefore questionable whether they would have any significant impact on the outcome of a battle.

The better availability and higher occurrence of natural deposits did represent another advantage of iron over bronze: It was much cheaper. As iron ore was far more common as a

resource on the Central Plains than copper and tin were, and available in a wider array of environments, it required less financial and economic effort to acquire and use. Wagner sees this as the underlying reason why cast iron metallurgy was developed in southern China first; copper deposits in those areas were rare, so when iron smelting technology arrived it would have seemed like a viable alternative to bronze earlier than in northern areas, where the raw materials for producing bronze were far more common. While the white cast iron produced in the beginning would not have been of great use for the production of weapons, its extreme hardness in addition to its low cost would have made it perfect for the mass production of tools for agriculture and crafts. This made iron superior to bronze even before the invention of malleable cast iron – not in its mechanical properties, but in economic terms (Wagner 2008: 147). The mass production of agricultural tools is credited to have induced a rise in agricultural production during the Spring and Autumn and Warring States periods (Hsu 1999: 578); seen in this light, the innovation of iron metallurgy was incisive indeed.

The question that is left open is whether any state would have been able to profit from using iron technology earlier than other states. We have concluded that the Warring States' preferred armies consisting mainly of massed infantry are not likely to have been equipped with any large numbers of iron weapons; not only would this have been far too expensive to implement, archaeological data also shows that iron weapons were relatively rare items up until the Han dynasty, and bronze weaponry was by far the preferred material during the Warring States. Even though the frontier regions that would later belong to the states of Qin, Yan, and Zhao, can be shown to have had access to the new technology before the more central regions, the small numbers of iron swords would probably not have left any great impact on the struggles of the period. Takeshi's original hypothesis therefore clearly cannot be maintained in the light of today's evidence.

We have seen that the massive numbers of iron swords Qin would have needed for its conquests probably never existed. Still, Wagner (1996: 199) points out that the technical background necessary for the manufacturing of iron swords is visible in the archaeological data for Qin at a time when no such background can be detected for Chu; interestingly, it is only after Qin's conquest of Chu in 278 BC that iron swords appear to have been used there. It is therefore possible that Qin's success in that case was indeed to a degree conditioned by the presence of iron weaponry on their side only. The following conquests, however, cannot be

explained this way. By the early decades of the 3rd century BC, iron metallurgy had come into relatively widespread use throughout China.

What we can see happening on the Central Plains after the advent of iron metallurgy is that the power of the Zhou court starts to wither, while the feudal lords gather power towards themselves; and while iron metallurgy slowly gains a measure of popularity, the feudal system itself starts to unravel as a few states gather enough power to overtake their rivals and set up larger and more centralized kingdoms. It has been suggested that the advent of iron metallurgy was responsible for the death of the feudal system, based on the argument that iron tools increased agricultural production in such a way that made the well-field system, on which the Zhou feudal system relied, redundant (Li and Zheng 2001). It is possible that the arrival of mass-produced tools helped in the downfall of small fiefdoms that were not able to keep up with the demands of production the same way as others; the mass production of iron requires a large amount of organization, from the supply with fuel to the procurement of the raw material to the assembly of a sufficient work force. Bigger and more centralized states would definitely have had an edge in that respect and soon leave their smaller rivals behind.

From the downfall of the Zhou court onwards, the power of a few states grew considerably, and in the end only a few enormous states came out of the continuous struggles. It could well be that the seven major states left standing after ca. 400 BC were the ones that were able to implement this new innovation more successfully than others and grew wealthy through it. We have also assumed that, as iron smelting technology and probably further innovations in the manufacturing process arrived from the steppes, the three frontier states Qin, Yan, and Zhao all could have profited from their vicinity to them. Continuous innovation, in general, would have been easier with a constant flow of outside stimulus (Curtin 1984: 1); the frontier states' weaponry, tools, or production techniques could then always have been a step ahead. We know that all three states grew in power and extended their territories at the expense of Chinese and foreign peoples alike; but whether their successful implementation of steppe innovations like iron metallurgy had much to do with it remains speculation at this point.

To sum up all of the above, it seems to be an almost inevitable conclusion that the impact of iron metallurgy, i.e. weaponry made of iron, on the actual battles of the Warring States

would have been minimal. As iron weapons were not yet widely used, any improvements in their material properties, construction, or length would only have limited impact. Iron swords or other weapons clearly could not have been the one factor to tip the scales in favor of one army or the other. Certainly, as a new technology, iron metallurgy made an impression and would go on to transform the weaponry in China over time; but in the very beginning its advantages would not have been quite as noticeable in comparison to the tried-and-true bronze. However, even if iron technology did not make a big difference in military strength directly, it certainly must have had an impact on the economic strength of a state. If the connection of the increase in agricultural production with the advent of mass-produced iron tools is valid, it could have made a world of difference; any state that was able to implement this technology to its full advantage would have had at least the potential to thrive as a result.

3.1.2. Horseback Riding

Like iron metallurgy, horseback riding entered China in a form that makes it interesting to look at its impact on battles. As we have seen earlier, it was plainly adopted from the steppe nomads as a warfare method. Chapter 2 has shown that cavalry warfare might or might not have been first instituted by the state of Zhao, but is certain to have been adopted from the steppe nomads and therefore likely to have appeared first in one of the frontier states; and also that it would have been employed mainly to counter attacks from and gain an advantage over fellow Chinese states.

Now, as we know that the Chinese adopted their method of cavalry warfare from the steppe nomads, we also know that the earliest Chinese cavalry must have been light cavalry, i.e. only lightly armed and armored and employed not in direct shock combat and massed charges but in skirmishing and for other tasks such as scouting ahead, securing the flanks, defense during retreats, raids, cutting of the enemy's supply lines, and so on (Lewis 1999: 624). Still, the horse's speed and bulk would serve to have an intimidating effect on the enemy, especially on the unseasoned peasant soldiers among the army; an effect, however, that must be expected to have diminished after some time, when mounted units became more common and soldiers were used to and prepared for those attacks. Also, even a light cavalry force was able to deal quick, powerful blows to the enemy's flanks or rear, and disrupt the enemy's formation by sending volleys of arrows from a distance and inspiring fear

and confusion in surprise attacks. When engaged, a rider could also join mêlée combat with his secondary weapons; usually the sword, as we have seen.

On the basis of the above, one must assume that having a division of cavalry would have been a powerful asset for any state's army; it would definitely have changed the course of battles by widening the array of strategic moves available, and the question of having or not having a cavalry unit, as well as the unit's numbers, quality of material, and training would then have an impact on their outcome. However, looking at any information on the way early Chinese cavalry must have operated first gives rise to the suspicion that it might have been otherwise; that is, that cavalry did not play a great role in the battles of the Warring States Period, and that its absence or presence in an army or questions of quality or numbers would not have been important matters to consider.

The main reason for assuming this is the relatively small size of the cavalry units employed in the armies of the Warring States period – they would at its height not be more than about five to six thousand strong, and generally be much smaller (Lewis 1999: 624). As we have seen, the battlefields of the period were increasingly dominated by large-scale conscript armies whose numbers had, by the time cavalry warfare was adopted, reached unprecedented heights. Historical sources of the time speak of Qin, Qi, and Chu mobilizing armies numbering up to a million, while the cavalry only reaches counts that amount to about 1% of these numbers (Dien 1986: 37). These figures, however, were probably not so much intended as accurate representations rather than to express that the state in question fielded the "largest possible army" (Lewis 1999: 625). Cavalry units of mounted archers in this period, so it seems, were only used as supplements to the main infantry (Twitchett and Loewe 1986: 25; Dien 1986: 37).

The reasons for the small size of cavalry units were many. We have already seen above that cavalry at the time was probably an elite affair; this alone points to small numbers. For the successful implementation of cavalry, so Creel (1965: 649), three things needed to be put into practice: One, suitable horses had to be bred or acquired, two, the horses had to be trained for warfare, and three, the techniques of riding and simultaneously using an array of weaponry from horseback needed to be mastered by the rider. In the early times, shortly after the adoption of the warfare method, all of these factors would have represented a problem for the Chinese. The only exception would be the scenario mentioned in Chapter 2,

in which the states employed bands of nomad mercenaries for the task: in this case, all of the above problems would be circumvented, as the nomads would have brought their own horses and weapons as well as expertise and training.

The problem of good quality horses being in limited stock is a recurring one in Chinese history. The lack of suitable pastures and the general inexperience of most Chinese in the handling and raising of horses comes out often in ancient records and it is clear that the Chinese had to import horses from the steppes for as long as they used them, in order to replenish and improve their limited stocks (Beckwith 1991: 185). Before and during the Warring States period, chariots and horses were an elite affair owned by the nobility and people of importance and wealth; this apparently did not change with the arrival of riding and cavalry warfare. As good horses were in such short supply, they would also have been owned by officers and noblemen – as would the early specimens of long iron swords. Initially, a good warhorse would have been as much a status symbol as a chariot – if only because they were so preciously rare.

In the very beginning, the skills needed to use horses in warfare would also have presented a challenge for the Chinese people. First of all, a war horse needed to be trained, and it is not an easy task to prime a horse – a creature naturally tuned to flee in the face of danger – for battle; although, we must assume that chariot horses needed that kind of training as well. It is even more challenging to train a horse for mounted combat: It needs to learn to keep calm and on its course when the rider lets go of the reins to shoot an arrow, and to respond to signals besides those transmitted through the reins, i.e. weight shifts, voice and leg commands; all of this despite arrows whistling past its head. This kind of training is a process that takes several years, even with modern training methods today.[14] In this case, there are indeed indications that the Chinese circumvented this problem by employing foreign horse-handlers; these seem to be almost exclusively depicted as non-Chinese in artwork (Creel 1965: 670).

The second skill needed lies with the rider himself; as with the horse's training, it takes several years of intensive practice in order to being able to shoot arrows successfully, i.e. in a

[14] This is inferred from modern day attempts at reviving the art of horseback archery, most prominently by the Hungarian master Lajos Kassai, who has written a book on the subject: Kassai, Lajos (2002), *Horseback Archery*. Püski

more or less controlled and precise manner, from the back of a galloping horse; to this, add the skill of securely controlling the horse at the same time. We have already concluded that the Chinese must have learned this directly from foreign instructors; even, that it is very likely that the early cavalry warriors in China were indeed foreigners or frontier people who had been riding and shooting from horseback for decades, if not centuries. In summary, it is clear then that early Chinese cavalry units could not have been very large. Either they were smallish bands of foreigners hired for the purpose, or the very rarity of horses and of the skills needed to employ this warfare technique would have ensured that only a limited number of people were able to employ it.

In fact, though, large numbers are not needed for skirmishing and all the other tasks light cavalry units would normally have carried out. While we still do not know much about the cavalry of early China, we can see from similar, contemporary examples that a small force is more than enough for these purposes. For example, the Greek cavalry divisions of around the same time (i.e. around the 5th to 3rd centuries BC) were similarly equipped – with projectile weapons and supplementary swords – and only between five hundred and one thousand strong. Their attacking power was still considerable, and even a small force was able to "inflict considerable damage upon the enemy" (Spence 1993: 120, 103). Throughout history, there are many examples of small bands of cavalry – often comitatus warriors – turning the tide of a battle (Beckwith 2009: 145-6). There is no reason to suspect that the cavalry units employed in early China would have been any different in this respect; indeed, the professional tacticians that led the Warring States armies would probably have been able to use this new battle method to their utmost gain. The question is, what were the benefits of having a cavalry unit, and are there any signs that one state could have been able to use them more effectively than others, thereby gaining an obvious advantage?

The basic advantages a mounted warrior had over a foot soldier are of course clear: The horse provided the rider with an elevated platform from which to fight, as well as greater speed, mobility and mass with which to attack. In addition, the psychological impact, or shock value, of a cavalry attack also should not be underestimated. The latter of course dwindled when the opponents were becoming accustomed to cavalry and developed means to counter such attacks – in these early times spears, archers, and crossbowmen proved effective against the lightly armored cavalrymen. The unprecedented mobility of the horse-

mounted units would have proved a vital strategic asset; and in case both armies had cavalry divisions, the outcome of the struggle could well have depended on the strength and tactical finesse of the horsemen.

When we assume that the training and expertise connected to the technique of cavalry warfare came from the steppes, and explicitly from steppe peoples' direct instruction, it follows that closeness to the steppes – whether geographical or otherwise – would have meant quick and convenient access to this resource of knowledge. Close contact would imply easier supply with good quality horses and higher presence of foreign experts and mercenaries; but what role would the factor of better access to horses and expertise really have played in a Warring States battle? Are there any actual examples of battles won by the cavalry of an army?

Some scholars (e.g. Creel 1965: 651) have of course suggested that the adoption of cavalry gave the state of Zhao an advantage over its opponents; according to the *Shiji*, it conquered the state of Zhongshan in 300 BC, only a few years after the adoption of cavalry (Chavannes 1967 [VI.5]: 87). Zhao's prowess with cavalry is also often said to be exemplified by the battle against Qin a few years after that, where Zhao dealt Qin a devastating defeat (Lewis 2007: 37). However, a short while before that battle, in 295, Qin had already been crushed by the combined armies of all six of the other states; it seems that Qin's being weakened by this defeat must have played a much more significant role in Zhao's later victory than whether or not employed cavalry. There is, however, also no evidence *against* the view that Zhao profited from having a cavalry division; it could well have been that Zhao was the first state to employ mounted forces, or at least the one to employ it most successfully, and that this happened to be the decisive factor in this battle.

L. C. Goodrich (1948) suggested that Qin's mastery of cavalry, among other new arts of war, was part of its eventual success over the other states. Qin Shihuang was the one who introduced large cavalry detachments into his army, which were heavily armed and armored, even down to protective armor for the horses (Ishjamts 1999: 163). However, we know this from the terracotta horses and warriors from his tombs; it is not clear for how long this kind of heavy cavalry had been employed. In any case, some of the states Qin conquered had already been broken by others by the time Qin attacked them: Wei had been defeated by Qi, Qi in turn by Yan (Lewis 1999: 634). In a way, Qin finished what others had begun; whether

their successful employment of cavalry or their first introduction of heavy cavalry for shock combat played a significant part in those conquests or not, is now difficult to assess. With all the many different factors at play in an actual battle, all that can be said is that the quality, numbers, and tactical plays of a cavalry unit *could* have been, but must not necessarily have been, decisive for the outcome.

Horseback riding in general

In the last section we have looked at the possible impact the adoption of horseback riding might have had on China's battlefields; however, it had additional ramifications that we will look at now. We have seen in Chapter 2 that the Chinese, to all appearances, did not ride before the advent of cavalry warfare in 400-300 BC, and were still no avid riders for long times afterwards. Horses basically served as luxury draft animals before that time, something only privileged people could afford; the common folk used carts, oxen and asses. The advent of horseback riding, so it must be assumed, helped to facilitate quite a few things; mainly, it must have represented a large step forward in terms of human mobility. Persons and small goods could have been transported over longer distances noticeably faster (Kelekna 2009a: 65).

The greatest advance would have been visible in the transmission of information. The sources on how information was transported before the advent of horseback riding are scarce; while it seems that chariots might have been used for that purpose for state matters or in battle, they were ill-suited for it, as they were not only difficult to maneuver on uneven terrain, but also very fragile and susceptive to damage. If at all, more solid horse-drawn wagons must have been used; but most likely runners would have been employed, much like in other parts of the ancient world.

The advent of riding on horseback must have represented a breakthrough in the transmission of news and information by permitting it in unprecedented short time, and therefore would have been an instigator of social and political change; it would certainly have facilitated the establishment of an efficient information network. The continuous wars of the period had very direct consequences for the communication at the time: As the armies grew in size, it became increasingly important to have a network of roads to move them quickly and efficiently; this must already have started during the Spring and Autumn period, when

roads were necessary to move large arrays of chariots to the battlegrounds. Often, armies must have built roads while on the march to facilitate their progress. These roads already improved communication, but only the advent of horseback riding made them the high-speed information arteries they could be. In addition, horses greatly facilitated communication for managing the strategic movements of large armies; a vital asset especially for the sizeable armies of the time.

But speedy information delivery would of course also have been a vital asset off the battlefields. The establishment of the first postal system in early China has been dated to the Warring States period; these systems worked through a network of postal stations, where a messenger on horse could rest and change horse quickly. Later, during the Han dynasty, this system would be extended all the way to Xinjiang (An [Zhongyi] 1994: 275). It is possible that a similar system using runners instead of riders was used before, and the new postal system built on this. In any case, it seems logical that the arrival of horseback-riding would have been a great step forward in terms of the speed in which information, people, or items could travel.

Besides the obvious convenience, the development of an effective system of information transmission had some other noteworthy effects. After the constant wars of the Spring and Autumn and early Warring States periods had severely weakened the feudal system, bureaucratic administration budded in most of the Chinese states; a development also encouraged by military competition, as more efficient forms of administration were needed for the effective management of larger armies (Kiser and Yong 2003: 512). One of the necessary preconditions for a functioning bureaucracy, however, is an effective system of communication. The earlier wars had already provided a better network of roads; some technological innovations then were necessary to acquire the "monitoring capacity" necessary for the development of a bureaucracy: "Because monitoring capacity is primarily a function of the development of technologies of control (communications, transportation, record-keeping), the emergence of bureaucracy is expected to be a function of improvements in these areas." (Kiser and Yong 2003: 515) For transportation as well as communication, horseback riding would have provided a great improvement and, it must be assumed, might therefore have been one of the big factors that helped propel ancient China into the age of bureaucracy.

At this point it might be interesting to note what we know about Qin: We know that it had a large and well-built network of roads and that it was situated in close vicinity to the steppe and its horses. It also happens to be the state with the largest bureaucratically organized administration; although even Qin was only partly bureaucratized, its administrative innovations were of such a revolutionary nature that they outlasted the dynasty itself by more than two millennia (Kiser and Yong 2003: 512). Now it is not obvious whether better access to horses would be cause or effect in his equation; it might have been both: A strong bureaucracy would have been able to develop because of good access to a large number of horses, but demand in horses would also have risen after the implementation of the bureaucracy and better access to them sought more specifically. The question must be asked how much of its development Qin owed to its successful implementation of horseback riding for communication and its convenient access to steppe horses.

To summarize, we have seen that the innovations that entered China during the Warring States Period might have had less impact than initially imagined. The use of iron metallurgy, i.e. iron weaponry, in battle was at first limited by the properties of the material and the cost of manufacturing and only became more widely used towards the end of the period. The economic advantages of cast iron would certainly have played a significant role, but which role this was exactly is not clearly visible from the archaeological and historical information we have. The introduction of cavalry warfare was, in turn, limited by the lack of suitable mounts and the lack of training and expertise needed for both horse and rider; but we have seen that it is likely that these limitations were, at least in the beginning, surmounted by the employment of foreign mercenaries who would not only bring their own mounts but also the necessary training, and would in the course of their service also have been able to train Chinese warriors to take up the reins later on. We have also seen that even small divisions of cavalry would have been able to leave significant impact on battles. Furthermore, the innovation of horseback riding seems to have been vital for the development of a superior information network and, ultimately, the bureaucratic system. For all of this, i.e. cavalry warfare as well as building an information network, an inexhaustible supply of horses was necessary; however, we have seen that China was not able to keep up with this demand on its own. We will take a look at the ramifications of this in the next section.

3.2. The General Importance of the Interactions with the Steppes

3.2.1. Horse Trade and Supply

We have seen that horses were in great demand in early pre-imperial China – a demand that the Chinese themselves were not able to meet. Throughout Chinese history, procuring a sufficient number of good quality horses for all kinds of purposes was a serious problem (Sinor 1972: 174). One, perhaps the most important, reason was the distinct lack of suitable land for pastures needed to raise large numbers of horses; even up to modern times, until horses lost importance for most tasks, China was always dependent on the steppes to supply them with the coveted mounts.

From the very beginning and up to as late as the Qing dynasty, China was never able to become self-sufficient in the production of horses (Creel 1965: 665). The vital role horses always played in Chinese politics is illustrated by examples throughout history, such as the An Lushan rebellion. Historical sources indicate that the Qin dynasty was importing so-called 快蹄 *kuài-tí* horses from the steppes for the imperial stables at least a century and a half before emperor Han Wu-di would be trying to acquire horses from Ferghana (Creel 1965: 658). Wu-di's quest, at first for the 天馬 Heavenly Horses of the Wusun, then for the 汗血馬 "blood-sweating" horses of Ferghana, is one of the best known examples of China's historical coveting for steppe horses (Hulsewé 1979: 42; Kelekna 2009a: 146-8). While there was of course more to Wu-di's western campaigns than just horses, they were a vital factor; or at least that is what the amount of resources poured into obtaining them would make us believe. It was in the course of this quest for horses that Zhang Qian travelled to the west and for the first time brought back reliable accounts from the lands and people there; the campaign ultimately led to the initiation of state-controlled long-distance trade and is considered by some historians to mark the beginning of the "Silk Road" commerce.

During the Han dynasty in general, the breeding of horses became an explicit state affair, and it was encouraged among the general populace as well (An [Zhongyi] 1994: 273), but this did not alleviate the need for steppe horses. Even earlier horses must have been, if not a state affair, then an affair of the ruling elite; the postal network we mentioned above, as well as the cavalry divisions of the military were state affairs for which horses were an absolute necessity. Furthermore, only comparatively wealthy or influential persons would have

owned horses and be able to use them in battle and carrying information. All of the above clearly illustrates how important access to the horses from the steppes was for China's rulers; this was true from the very beginning when chariots first began to be used on Chinese battlefields, up until the time when horses were replaced by jeeps and tanks.

Large-scale trade was an outcome of this need; in fact, the Chinese want for horses was the very trigger that spawned extensive trade of silk and other luxury goods across the border. Apart from horses being, eventually, the reason for the "official" opening of the Silk Road, horse trade was very likely also the reason for China's first involvement in the Central Eurasian trade system. As soon as the chariot was adopted among the Chinese nobility, a constant stream of high-quality horses from the steppes would have been desirable, and the Chinese would have traded their luxury goods in exchange for the prized animals. Later, when cavalry started to become an important component of the Warring States armies, trade in horses indeed made up the biggest part of the economic interactions on the borders to the steppes (Lewis 2007: 129).

When discussing the trade with horses, one almost inevitably must come back to the Yuezhi. In Chapter 1 we have seen that they were clearly involved in horse trade with the Chinese. Liu Xinru (2001) cites evidence that points to a chief of the Yuezhi ("Lou of the Wu Zhi") having been the major supplier of good steppe horses to the first emperor. The Yuezhi were well-known for their horses, and it seems they commonly exchanged them for the silk and other luxury items they would have been able to get from the Chinese. The breeding, import, and trading of horses seems, in fact, to have been the main base of their economy and ultimately their great wealth and power (Benjamin 2007: 35).

Seen from the all the above, then, proximity to the steppes and their inhabitants implied for the Chinese states, very simply, better access to the horses from the steppes and therefore in effect more and better horses. When talking about the advantages a state of the Warring States Period would have to gain by closeness to and thriving relationships with the steppe nomads, one must invariably come to speak of horses.

Of course, one must assume that a frontier state like Zhao, Yan, or Qin, would have had an advantage in this respect; not only were they closer to the steppes and could therefore engage in direct trade with the nomads and thereby acquire as many horses as their counter-

parts were able or willing to trade in exchange for their luxury goods, we have also seen that all of the three states expanded into the steppes at the cost of the nomads. This would have given them suitable land to pasture large herds of horses. It is explicitly mentioned in the same passage of the *Shiji* that was discussed in Chapter 2, that the state of Zhao set up a region in the Ordos specifically for raising and training cavalry mounts; this area had been annexed only a short time prior to the adoption of cavalry warfare (Bai 2006: 140).

With their geographical location at the borders of the Chinese cultural zone, the three peripheral states had another strategic advantage: If they so desired, they were able to completely cut off the more central states from the supply of horses and other trade commodities from the steppes. It is very likely that they would have used this fact to their benefit, if only to control the trade that went on towards the south and center. Now, Qin was situated at the end of the Hexi corridor – that is, directly at the end of the area said to have been the territory of the Yuezhi. We have already seen that Qin would have had an advantage in procuring horses for its wars and other purposes, and that it would have been able to direct and even block trade of horses to other states; if we assume that most of the trade in horses was going through the hands of the Yuezhi, Qin would have been able to cut off even Zhao's supply of horses from the steppes (Liu [Xin-ru] 2001: 286).

Above we have seen that the role of cavalry in Warring States battles might not have been a very important one, or at least that its exact impact cannot be assessed now; however, a good supply of horses would also have been fundamental, for Qin as well as the other states, for setting up an effective system of communication. Qin's efficiency in implementing Legalist rule might have been based to a large part on its ability to do exactly that. This information network would have been even more important after the conquests and the unification of the Chinese states: In order to keep the now vast territories under control, effective communication would have been indispensable as a basis for the bureaucratic administration (Kelekna 2009a: 141). In any case, Qin's position would have entailed benefits in that respect; we know that Qin had been in this very location from the very beginning of its existence – wouldn't it then have profited from any trade coming through the Hexi corridor from the lands beyond?

3.2.2. General Trade

While horses made up an important part of the trade with the steppes, the trade was of course not limited to them. In Chapter 1 we have seen how the different economies on either side of the ecological border would have represented a natural incentive for mutual exchange; as different economies gave rise to diverse societies and cultures, not only food items but also other products would have been dissimilar enough to elicit interest in the other party. We know, and have seen in many examples in this work, that the exchanges between the steppes and the early Chinese culture zone were many and expansive and brought a lot of new things to China. But apart from the direct consequences the access to certain innovations or assets (like horses) or lack thereof would have had on the power of states and the course of battles and political developments, there were also the more general benefits a state would gain through thriving trade relations.

Trade over these ecological borders would, of course, eventually be the venue for the innovations discussed in Chapter 2 to cross over into China; it is possible, for instance, that the first iron swords entered China as trade items, even before mercenaries or technical workers brought them with them; the same goes for other weaponry or items used in tandem with horse riding. Trade would have been the basis for the relationship between the frontier peoples; "first contact", so it seems, would have been made through or at least involved some form of friendly barter, and all other interactions would be based on and derived from it. Obviously, trade will not only bring useful items, new knowledge, skills, or technology to either side involved in it; in its basic incarnation and purpose, it will generate revenue and wealth – and thereby power and influence, something well evidenced by the status the Yuezhi enjoyed on the steppes.

If we come back to the importance of ecological borders, there is some evidence that the interactions even spawned the rise of new states. Sometimes, a new ecological border would arise when a climate change or extensive forest clearings led to new agricultural settlements; the evolving trade exchanges then generated revenue, which would function as a basis for growing power and new states would develop as a result (Christian 2000: 87). Liu Xinru (2001: 262) writes that "one might claim that both Chinese culture and Indian culture were created by interactions of nomadic and sedentary cultures", as these interactions deriving from the interdependence of nomadic and sedentary societies were so vital and the

nomads' contributions to civilizations immeasurable. It is a definite fact that from the very beginning, trade relations far outweighed hostile interactions between the ancient Chinese culture zone and the Central Eurasian steppes. Not only can it be argued that the rise of Chinese civilization itself was a result of the interactions with other cultures – the trade relations ultimately also made sure that ideas entered China that would transform it to no small degree. The very concepts of "China" and "Chinese" as being separate from the "outside" and the "non-Chinese" were borrowed from the Indians via Central Eurasia and arrived only in the 4th century BC; in fact, they must have arrived with Bactrian people settling in China, and it might well be that these immigrants also carried some of the other innovations we have seen in this work (Beckwith, publication forthcoming). The notion of a common cultural identity was an innovation that had an even more incisive impact on China than the technological innovations or economic benefits could ever have had; it became imprinted in Chinese culture to an extent that is visible even today.

Looking at the "highway" represented by the steppes of the Hexi Corridor and Xinjiang and the nomadic peoples carrying things back and forth along it, one might spot one outstanding fact: The state of Qin was situated right at the very end of it, where it entered the Central Plains, from its very beginnings as a humble dependency of the Zhou court. In the light of all the things we have discussed, it certainly strikes one as significant that this state was on a constant rise, getting ever stronger and more powerful, since the day it was set up at the banks of the Wei river; a rise which eventually culminated in its taking over the rule over all Chinese states and unifying them under central rulership, more than half a millennium later. The state of Qin and its relationship to the steppes therefore definitely warrant a closer examination.

3.3. Why Qin?

In the course of this work the state of Qin has been mentioned many times. It is, in its being a frontier state, a frequent location of findings for the innovations of Chapter 2; it has been said to have profited both from its use of iron swords and cavalry; and we have now seen that it would have received all the benefits from its location at the Hexi corridor full on. Is it coincidence that Qin also happens to be the state that would go on to conquer all of China? At this point in the discussion, it is indeed hard to conceive that Qin's vicinity to and relations

with the steppes and all this implied did *not* have anything to do with its rise and eventual success. In this section, we will examine the reasons that speak in favor of the view that Qin profited from its steppe relations.

Qin's history is – discounting a few intermittent periods of decline – one marked by continuous expansion and growth. It originated as a small western dependency to the Zhou court in 897 BC; a horse-breeder by the name of 非子 Fēi Zǐ was given the territory with the explicit assignment to provide fine horses for the court (Twitchett and Loewe 1986: 31). It was situated at the banks of the Wei River, about 300 kilometers west from today's Xi'an, and therefore at the far western margins of Chinese territory at the time, close to the steppes. In the subsequent centuries, the tenants had to hold the land against incursions from the surrounding Rong people, and they rose in the esteem of the Zhou rulers who eventually made Qin a duchy. In 771 BC, the Zhou court's move from 沣镐 Fenghao near Chang'an in the Wei River valley to their new capital 成周 Chengzhou (later Luoyi, present day Luoyang) left behind a gaping vacuum of power (Hsu 1999: 546). This Qin was quick to fill, extending its territories all the way to the Yellow River, over which it exercised full control by a century later (Hsu 1999: 559). While the power of the Zhou royal court was continuously waning, the might of the state of Qin grew. In 366, Qin triumphed in a battle against the combined armies of the states Hann and Wei (Lewis 1999: 618). Around the 5th century BC, Qin controlled vast territories from the Hexi corridor to the bend of the Yellow River; in 350 BC, Qin moved its capital from 雍 Yong (modern Fengxiang, Shanxi) to 咸陽 Xianyang (Twitchett and Loewe 1986: 31).

In 325 BC, the duke of Qin assumed the title of 王 'king', as did all the major rulers at the time (Twitchett and Loewe 1986: 38). From then on the expansionist campaigns were picked up with new fervor as every state strived for domination. In 316 BC Qin seized the vast territories of the Chengdu Plain from the state of Chu, greatly weakening its southern opponent in the process and almost doubling its own territory. By the mid-third century BC, Qin had become the dominant power in China and never lost a battle from then on (Lewis 1999: 632). In 256 BC, Qin conquered the remaining vestiges of the state of Zhou, which had only played a symbolic role in the previous century – thus officially ending the Zhou dynasty.

During this long period Qin was also busy expanding into the steppes. As we have seen in previous chapters, all of the border states were doing this – their main incentive being more resources and therefore more strength to gain an advantage over their opponents. Qin expanded northwards and westwards, closer to and into the Hexi corridor; it took up most of what are today the provinces of Gansu, Ningxia, and Shaanxi, as well as portions of Sichuan to the south. This also means that Qin included many different ethnic groups within its territory that were subjected to central rule and were probably regarded as Qin citizens. Many of these people must already have been horse-riders at the time they were taken over, and of course Qin acquired vast lands suitable for raising horses in the process.

While Qin of course wasn't always in the most powerful position, its constant growth over the course of a few hundred years, in size as well as in influence in Chinese political affairs and impact on wars, is clearly visible. In 246 BC, Qin Shihuang ascended the throne of Qin; he started to exercise power in 238. After this, conquests of the other states followed in rapid succession: Hann was taken over in 230, Zhao in 228, Wei in 225, Chu in 223, Yan in 222, and finally Qi in 221 BC (Twitchett and Loewe 1986: 38). While some of the states had already been broken by others by the time Qin conquered them, their final defeat at the hands of Qin marked the end of the Warring States Period and the beginning of a China unified under the rule of the newly founded Qin dynasty; a dynasty which, although it only prevailed for a few short decades, still managed to have a disproportionally large impact on Chinese history.

Much ink has been spilled over the question of the reasons for Qin's success. What was it that made the state of Qin stronger and more powerful than its opponents? What were the factors that allowed Qin to triumph over its Chinese adversaries and assume central rulership over all of China?

In the course of this work, we have already seen mentioned the theories regarding Qin's technical advantages. It has been suggested that Qin's superior iron swords were one of the reasons for its triumph (e.g. Twitchett and Loewe 1986: 46-7, Keightley 1978: 31); but as was explained above, those vast numbers of iron swords Qin would have needed for its conquests probably never existed. If we look at the evidence, it does indeed seem that Qin was among the first areas in China where iron blades were used; but those were still the luxury weapons we have identified above and could not have had an impact on battles as signifi-

cant as envisioned by earlier theories. As we have seen, Qin's conquest of Chu might be a possible example for its superiority in iron metallurgy; however, the following conquests cannot be explained that way, and definitive proof of the superiority of Qin's weapons is still lacking (Wagner 2008: 146). Cast iron, on the other hand, presumably had great benefits in terms of economy; we have seen that the main advantage of cast iron was its cheapness and perfect suitability for mass-production (Wagner 1996: 49). It is indeed conceivable that Qin was able to benefit from these properties more easily than other states: the mass-production of iron needs man-power and resources, both of which the centrally organized, bureaucratic state of Qin would have been better equipped to provide. Production of iron in a blast furnace is most efficient at high capacities of production, and Qin's superior administration would have ensured a steady supply of workers and fuel and would also have guaranteed a large, stable market and good transportation (Wagner 2008: 147). Qin could then well have had an advantage through its higher efficiency in the production of iron.

A few scholars (e.g. Goodrich [L. C.] 1948) argued that Qin's successful implementation of new warfare techniques, in particular the use of divisions of horseback archers, helped in its conquests. According to Ishjamts (1999: 163), Qin Shihuang introduced large, heavily armored cavalry detachments into his army, although there is no information as to when exactly this happened. In any case, it is clear that Qin must have had cavalry as soon as Zhao or soon after. Qin would have had some advantages in the implementation of cavalry warfare: it had ready access to good quality horses from the steppes – at first through trade, later by being able to raise their own on the territories they conquered. Then there is the part about Qin being founded as the seat of a horse breeder (Jiang n.d.: 211); if it is based on facts, this is an interesting clue. Horse breeding was not something undertaken widely in early China, and having a gift with horses could point to an association with the steppes. The location at the Wei River, surrounded by the steppes, was probably picked for its suitability to the task of producing horses.

The theories we have seen mentioned therefore do have a point: Qin could have been able to profit from both innovations, either directly by employing it earlier or more efficiently than others, or indirectly by having them boost its economy. However, we have seen that the impact of these innovations was limited at the beginning; they could not have been the

only decisive factor in a battle and in the same way they probably were not the only decisive factors that helped Qin succeed.

In addition to the above theories, almost every possible factor has been considered for a reason or part of the reason of Qin's success; in the Cambridge History of China (Twitchett and Loewe 1986: 45-52) a very extensive list is given. One factor is that Qin allegedly had advanced agriculture due to effective irrigation systems, which allowed for greater population growth and wealth and thereby, for example, also for larger and stronger conscript armies. Irrigation systems were up-and-coming during the period and other states were starting to use them as well (Twitchett and Loewe 1986: 546). It might be, of course, that Qin's well-functioning bureaucratic organization allowed for a more effective and widespread use of the new technology, much like with the mass-production of iron.

Qin's wholehearted adoption of Legalist thought under 商鞅 Shāng Yāng is also often thought to be connected to its success; it was the reason for its centralized, effective administration, which in turn allowed for economically prudent use of natural resources and the above-mentioned rise in effectiveness in agricultural production and also, of course, in military organization and the mobilization of conscript armies among the populace (Lewis 2007: 38-9). All in all, Qin's better administration is often cited as a major reason why it was able to go from kingdom to empire (Twitchett and Loewe 1986: 49). Other reasons mentioned are the longevity of Qin rulers, a factor that ensured the political stability necessary for reforms and campaigns to be undertaken, and the states' readiness to break with tradition, which links to its adoption of Legalist thought, but is connected just as much to its willingness to adopt innovations like cavalry warfare, and to their general readiness to employ foreigners, which allowed them to get foreign talents to work for them; and it also would show that they had little reason to hesitate to employ foreign mercenaries and horse-handlers. The latter shows very early in Qin history, when in 645 BC, Qin defeats Jin with the help of a foreign – i.e. Rong and Di – troop (Hsu 1999: 573). Qin was clearly using foreign mercenaries from very early on; many of them would probably have come from territory that was captured previously.

One reason that is frequently given for Qin's success is its geographical position. Due to its peripheral nature, so it is argued, Qin was better able to secure its flanks, and was furthermore surrounded by tactically favorable geographic features such as mountains and rivers.

From this western stronghold, Qin was able to gradually subdue their neighbors while being relatively safe from the encroachment of opposing armies, as there was no organized enemy at their back (Lewis 2007: 17). In fact, it has been argued, Qin subdued the nomads to its west in order to be safe from attacks on that flank when encroaching on the other states. We have already seen that this undoubtedly was not the main reason, but it might have played a role in the considerations – however, Qin never really managed to "subdue" the nomads, as it was claimed. In order to hold the lands it acquired in its expansion, Qin had to build fortified walls (Shen 2010: 205); and still, the nomads came. It also seems that Qin's geographical position was not such a vast tactical advantage after all; we have seen that it was defeated in the battlefield multiple times, even if not conquered completely, so Qin's topographical "shields" apparently were not such a great advantage and might not have been an important factor in its success at all.

There is one outstanding aspect of Qin's location that has never been considered to be related to its rise and success: its vicinity to the steppes, or more specifically its location at the end of the Hexi corridor-Xinjiang trade artery. After everything we have seen so far, this is baffling; even more so since we have seen that even the most traditional-minded scholars have acknowledged the existence of trade between early China and the steppes. Yet, no one has ever remarked on this trade having as large a benefit as helping Qin grow into a remarkable power and eventually dominating all of China. We have also seen in this work that the roles of iron, swords, and cavalry warfare in Qin's success all have been considered before; and also that a steppe origin for both iron metallurgy and cavalry warfare has been suggested by scholars as well. Despite this, the only connection between Qin's success and its shared borders with the steppes that has been made is that it ensured that Qin excelled in the "manly virtues" — i.e. that it would possess great experience in battle (Twitchett and Loewe 1986: 47; Lewis 2007: 16), and that Qin would have had access to many horses (Guo 2006: 16). As obvious as the connection between Qin's closeness to the steppes and its rise seems after this discussion — to the knowledge of this author, it has never been drawn before.

Qin was of course not the only state of the period to share borders with the steppes and engage in trade with the steppe peoples; its favorable location in regard to the steppes would then maybe not have been such an advantage over the states of Zhao or Yan, who

would have been equally able to trade with the nomads. However, there are a few clues that Qin might have had closer relations to the steppes and its peoples; that it had in fact close cultural and ethnic ties as well. Having cultural ties would have ensured busy contacts from the beginning and also probably have made these contacts easier. While we know that all the peripheral states of ancient China were multi-ethnic states to varying degrees (Hsu 1999: 565), there are indications that this was especially true for Qin, which was always known as a not very "Chinese" state (Twitchett and Loewe 1986: 31).

There is, for instance, the clue we have already mentioned: that Qin was established as the seat of a professional horse breeder (Guo 2006: 15); it is possible that the Qin ancestor's aptitude for horse-breeding might have something to do with a cultural affinity to or origin among the steppe peoples. Especially suggestive of Qin's multi-ethnic background are the faces of the Terracotta Warriors: they all have been molded with great care and love for detail, each one unique, and some indeed have very distinctive non-East-Asian features, like prominent noses with high nose-bridges and deep-set eyes (see *Bingmayong* 1983). They supposedly are a genuine representation of the real army of Qin Shihuang; while most of the soldiers were enlisted from the Qin people, this army also included many foreign recruits. There have been no studies of the features of the soldiers (to this author's knowledge), but even for a layman it is clearly visible that features of many different ethnicities are present.

Apart from its multi-ethnic population, Qin exhibited a few characteristics that marked it as different from the other Chinese states; it seemingly possessed a "distinctive national culture", to quote Lewis (2007: 39), "the clearest evidence of [which] is the fairly rapid emergence of a new discourse that associated Qin with non-Chinese barbarians and linked barbarian culture to Qin's political reforms." Some historical accounts from other states clearly considered Qin as being culturally backward and closer to foreign customs and ethnic groups than to the Chinese ones; however, this might not have had anything to do with Qin actually being a "foreign" state, but should probably be considered as political polemics aimed at discrediting the state that became ever more powerful and threatening to the others (DiCosmo 2004: 102). Sima Qian attributes Qin's unusual laws and cruelty to its being a peripheral state inhabited by many non-Chinese ethnicities (Lewis 2007: 40), and Qin's customs are likened to those of the foreign people Rong and Di (*Shiji*: juàn 44; DiCosmo 1999: 949), great parts of whom Qin had already incorporated into its realm by this time. Interestingly,

during this same period, Qin seems to have swerved from its earlier path of adopting and imitating Central Plains customs to establish itself as a Chinese state, in order to put greater emphasis on its "otherness": In one text of Qin origin, it is clearly emphasized that their music is different (*Shiji*: juàn 87; Bodde 1967: 19). The Qin people seem to adopt a different image of themselves, as being distinct from the other Chinese states; almost as if they had to display a newfound measure of self-confidence (Lewis 2007: 42-3).

A possible scenario is that Qin started out as a peripheral frontier state, maybe with founding ancestors of Central Eurasian origin, and started to thrive on its economically advantageous position; it would always have been a multi-ethnic state, not only because of its position but also because of the fact that, as Qin expanded north and west into foreign territory, it would have incorporated many people of non-Chinese ethnicity and culture within its borders. Qin would have been built upon different ethnicities forming natural parts of its population; but as it grew into an ever more powerful duchy and started to take more and more interest in playing its own role in the political dynamics of the Central Plain, Qin emphasized Chinese cultural customs and traditional mores to underscore its claim to such a role. Only later, when Qin had become a powerful player in Chinese affairs, did it start to undergo an ideological transformation: While it always continued to make a point of being ethnically Chinese and as belonging to the "Central States", it started to emphasize the cultural gap between Qin and the other, more pronouncedly "Chinese" states.

So, while the comments from other states were probably meant to discredit Qin, they do have a solid foundation in reality. As said above, Qin did incorporate many people of non-Chinese ethnicity; and the accusation that they adhered to different customs can also be shown to harbor a grain of truth: Archaeological excavations in Qin territory brought up the surprising discovery that Qin's burial customs were not quite the same as those of the more central states. Two distinct burial forms intermingled in Qin cemeteries: some deceased were buried in flexed, some in a supine position (Wagner 1996: 24). While the dead in the central states were normally buried in a supine position, flexed-mode burials have been excavated inside former Qin territory from the late Western Zhou to middle Eastern Zhou periods; until, with the beginning of the Qin dynastic rule, the supine position once again started to take over (Falkenhausen 1999: 496). The flexed-mode burial was a typical Central Eurasian custom and especially prevalent in the northern oases of the Tarim Basin and

throughout Bactria and Margiana (Chen and Hiebert 1995: 259). Burying people in this manner might have been a custom that immigrants from farther west brought with them and passed on to their offspring. Falkenhausen (1999: 496) comments: “The Qin tombs seem to evince religious concepts, possibly of western origin, that were novel to this area at this time.”

All of the above points to Qin having a shared culture and ethnic ties with the steppes, unparalleled by any of the other Chinese states. But what does this mean for this survey? It might mean, at least, that Qin would have had a much easier time implementing innovations from the steppes than its rivals, because of their commonalities with steppe culture; it might mean that Qin had easier access to foreign warriors and horse-handlers and people to teach them the skills associated with these innovations. It might also mean that trade and exchange with the steppe would have come more naturally; certainly the foreign parts of Qin’s population would have sustained some connections with their relatives in one way or another. And Qin’s multi-ethnic population would definitely have been an advantage in one other respect: The experience in managing such a diverse population would have been convenient for the administration of all the Chinese states combined into one large empire after the conquests. Qin’s success, so it seems, must at least have been conditioned by its marginal nature and all that it entailed.

There are many indications that the rulers of Qin recognized the effect the nearby steppes had on the development of their state and the potential this proximity held. It seems apparent that Qin consciously tried to strengthen its relations as well as its access to the steppes. By conquering the Rong, Qin not only defeated an old enemy — it also eliminated them as middlemen in the trade with the steppes, in particular with regard to horse trade. Later (in 215 BC), Qin Shihuang attacked and conquered the Xiongnu (DiCosmo 1999: 964); at that time, the Xiongnu were no threat to him, so he probably had greater benefits in mind. One of them could have been that the Xiongnu inhabited some of the best pastures in the eastern steppes, and Qin might have wanted to capture these on grounds of a military as well as administrational need for horses. But it also seems likely that the expansion might have been directed at gaining more secure control over the trade venues into the west; at the time of the Qin dynasty, the Hexi corridor was controlled by the powerful Yuezhi, and Qin would

have been very dependent on the nomads for any trade coming from further west – a fact which ambitious Qin Shihuang might not have relished.

Qin's geographical position therefore remains the most convincing point that supports the idea that Qin profited from its closeness to the steppes. During the whole period of Qin's expansion and growth in power, one thing never changed: It always centered on the Wei River, and was, as Lewis (2007: 10) says, "thereby connected to the Hexi corridor and the steppes beyond at its very political and administrative center." From its very foundations in the 9th century BC up to its becoming the first imperial dynasty of China, Qin sat at the end of this key traffic route between the Tarim basin and the Chinese frontiers and was able to reap the benefits this entailed. We have seen in Chapter 1 that the Yuezhi were major suppliers of horses as well as jade; it must certainly have been beneficial to be close enough to engage in direct trade with them. We have also seen the importance of the trade with the steppes throughout this work; it would have been a fundamental factor not only in furnishing Qin with swift horses and iron swords for its – eventually successful – warfare against the other states, it would also have brought the revenues to make possible the great changes in administration and to help finance the bureaucracy, irrigation systems, and governmental establishments that resulted in the growth in agricultural production and thereby the growth of Qin in general.

The fact that Qin not only always shared a very lengthy border with the steppes, had Central Eurasian features itself, *and* occupied the end of a route that carried all kinds of goods as well as innovations from the West to China, means that Qin would always have enjoyed very active trade on their borders; anything carried by the nomads coming through this way would invariably turn up right there. None of the other Chinese states, not even Yan and Zhao, could possibly compare with these conditions, despite their borders with the northern steppes.

Coming back to Chapter 1, we can conclude that Qin's proximity to and shared ecological border with the steppes probably did not help it so much to acquire innovations, and with them outdo their opponents and conquer the whole of China – although this might have been a factor as well; the trade and interactions rather were a vital basis and incentive for growth and productivity as well as a great source of economic wealth. In the light of the observation expounded above of ecological borders being able to spawn new states on the

basis of power derived from trade revenues, the very existence of Qin as a state could well have depended on that border it shared with the steppes; and much more so, its growth and eventual success. Of course Qin did not stay successful; and many or even all of the factors considered for Qin's triumph probably did play their own role as well. However, Qin's geographical as well as cultural proximity to the steppe and its inhabitants certainly has to be accepted into the ranks of these factors; it is impossible *not* to see that Qin must have profited from these conditions.

Conclusion

The findings and conclusions of this work serve to illustrate the tremendous importance of the interactions between sedentary early China and the nomadic steppe peoples beyond its borders. We set out to study the relationship pre-imperial China had with the steppes, concentrating on the period of the late Eastern Zhou or Warring States Period because of its pivotal significance for Chinese history, asking the question whether this relationship had any bearing on the developments during that era. The main result of this study undoubtedly is the inescapable conclusion that the interactions between the Chinese and the steppe peoples brought numerous groundbreaking innovations to early China and had to have a massive impact on the Warring States' political and social development.

This work has tried to bring together scholarship from different areas to paint a coherent picture of the nature of the interactions between China and the steppes. This image was, throughout Sinological scholarship, often invariably one-sided in only showing the hostile "barbarians'" incursions and attacks on the great Chinese civilization. Based on more recent scholarship from Sinologists as well as from historians of Central Eurasia we have seen that these antagonistic interactions absolutely take a back seat to the friendly contacts represented by trade and the exchanges that involved information, technology, items, products, and people. First of all, many culturally highly developed nomadic peoples were living in the steppes beyond the Chinese border, some of whom clearly were very powerful traders known as the providers of many vital goods to the Chinese. Not only did their presence show the inevitability of trade relations, also certain dynamics can be identified that practically guaranteed them: Most importantly, the ecological border between the two very different economies and the divergence of goods available on either side provided incentive for mutual exchange; in addition, the nomads' social organization under a ruler and his *comitatus* ensured that they would be dependent on trade to acquire luxury goods for its sustenance; goods such as silk, lacquerware, and porcelain, of which the Chinese happened to have plenty. The first section can be summarized as finding that China in the 1st millennium BC already was an extension and indeed a part of the vast Eurasian economic system known as the Silk Road.

The second section then showed that these interactions between China and the steppes brought two major, groundbreaking innovations to China during the period of the Zhou alone. On the basis of previous scholarship on the questions about the origin of iron metallurgy and horseback riding in China, respectively, it became clear that their Central Eurasian provenance has been known, or at least knowable, for some time. While postulating something along the lines of "iron metallurgy was adopted from the steppes" is probably a gross simplification of the process, because of the complexity of all the factors and the different peoples and their interactions involved in it, all evidence clearly points to one conclusion: Both iron metallurgy and horseback riding, as well as the related innovations such as cavalry warfare, the recurved bow, and the sword – and no matter whether they were transmitted as ideas or as complete items, whether they were taught directly, or whether it was a combination of all of these things at various stages in the process of adoption – their introduction into China was *without a doubt* a result of or nourished by the interactions with the Central Eurasian peoples. In case of the sword, in particular, this has become clear on the basis of linguistic evidence alone, yet is firmly supported by the archaeological data as well; plainly, some form of the sword was adopted from the steppes.

It has also been shown that the complexity of the technologies and techniques in question clearly indicate that direct teaching must have been involved in virtually all cases, but in particular for the techniques of iron smelting and horse-mounted warfare. This must have entailed immigrants who, in their functions as mercenaries or technical workers, brought the innovations and expertise; also well evidenced by the loanwords which show up in China at the same time. The second part therefore shows not only the revolutionary nature of the innovations that arrived in China during the Warring States Period, and confirms that they were adopted from the steppes, but also illustrates their complex character that guaranteed that they would involve very close relationships indeed, in order to be adopted completely and successfully; thereby it further underscored the importance of China's interactions with the steppes.

The third part focused on evaluating the actual impact the relationship with the steppes would have had on Warring States China. The innovations that were shown to have arrived via these interactions did leave their mark on the developments during the period: While the impact of iron metallurgy would, in the beginning, have been restricted by its material prop-

erties that ensured that iron weapons would be expensive and rare, and therefore limited its effect on the battles of the period, its cheapness combined with its common availability made it the perfect material for mass-production. At this early time, this circumstance would have had its biggest impact on agriculture, and in fact, the advent of cheap iron tools is credited with further promoting the overthrowing of the feudal system and ushering in the age of bureaucracy; and we have seen that increased agricultural production would have generated wealth, economic as well as in population, and therefore indirectly have dictated the strength of governments and the size of armies. Horseback riding, on the other hand, had a big impact on the battlefields of the time; cavalry divisions could well have turned the tables in a battle, even though, with all the factors at play, not necessarily so. Nevertheless it was a major military revolution capable of transforming tactics and warfare. In addition, horseback riding was a great asset in a different respect: it improved communication and transportation to an extent that must have had direct consequences for the development and maintenance of the most efficient bureaucracy of the time.

Apart from these tangible innovations, the interactions between China and the steppes had other effects as well; with the examination of these, the study came full circle. The ecological borders described in the first section ensured vivid trade relations between the Chinese and the nomads, and it has become clear that not only the nomads were dependent on trade for maintaining their social order; the Chinese needed a constant supply of horses for very similar reasons (i.e. maintaining their administrative system), in addition to the horses they needed for their military campaigns. The trade with the steppes also generated general revenue that helped build strong economies and support governments – even, as has been argued, to the extent that it could have instigated the birth of a new state or the founding of an empire.

In the light of these observations it has become abundantly clear that the relations with the steppes were more significant and had greater impact than hitherto widely believed; the nature and scope of these relations, especially the importance of the horse for China, the groundbreaking nature of the innovations transmitted, and the vitality of the trade across the ecological border in general, leave no doubt that any state sharing such a border with the steppes would have greatly profited from this condition. We have then seen that one state with particularly close ties to the steppes can indeed be shown to have drawn advan-

tages from this: Qin, the state that put an end to the Warring States Period with its own triumph over its rivaling states. It has become apparent that Qin's economy would, from the beginning, have been deeply affected by the trade with the steppes; that its development of an efficient bureaucratic system was dependent on a sufficient supply of horses; and that their successful adoption and use of iron technology and cavalry warfare in battle would be conditioned by their closeness to the steppes and the steppe peoples' expertise. Without a doubt, the connection between Qin's vicinity to the steppes and its eventual success must be added to the list of factors that have been taken into account; it is sure to occupy one of the top ranks.

The scope of this study was, of course, limited by the fact that it took place in the course of a master's thesis; for example, it did not allow for an in-depth examination of the archaeological data involved. There are still many gaps to be filled in the discussion of the origin and nature of transmission of iron smelting, the sword, and horseback riding; many of these are due to the absence of data. As new archaeological reports are continuously forthcoming, future examinations hopefully will be able to throw more light on these issues; for example, the change in horses' sizes in burials or extant horse gear would be interesting assessments, an evaluation of the change in length and material of swords excavated from sites of various periods helpful to shed some light on the manner and time frame in which it was adopted or its use on Warring States battlefields. Detailed examinations of historical sources could help in identifying an eventual rise in demand of horses by examining their exchange value at various times, and throw some light on the extent to which Central Eurasians – mercenaries or technical workers – were employed in Warring States China and therefore help illustrate their role in the transmission of items, expertise, and language.

Throughout this study, the important role of some of the Central Eurasian peoples in the transmission of innovations has been accentuated. In particular, the Saka or Sai stand out, as many clues connect them with the innovations treated throughout this work. They are said to have introduced horseback riding into the eastern steppes; we have also seen that Scythian culture is linked with iron metallurgy, and that iron smelting appears in Xinjiang around the same time as they did. Cavalry warfare, the recurved composite bow, and the long sword all seem to share the same connection and can be shown to have spread throughout the eastern steppes shortly after their arrival. Further research is needed on this; if the theory is

valid, then all of the innovations analyzed in the course of this work, which have been shown to have entered China during the Zhou dynasty, are part of a hypothetical “Scythian innovation package”, which would be remarkable in its own right.

All in all, the role of the trade and exchange across ecological borders, between sedentary and nomadic peoples, between peripheral empires and the Central Eurasians – in short, the role of the Silk Road economy in the transmission of innovations – remains a fascinating, albeit very broad topic to be studied. The vital role of trans-ecological trade in Eurasian history, or world history even, has been noted by scholars before; this study has shown that its role in forming Chinese culture and civilization likewise cannot be discounted. Even in the small timeframe of a few hundred years examined in this work, the impact of these exchanges was tremendous; in bringing major revolutionary innovations like iron metallurgy, the sword, and horseback riding to China, and in representing a decisive factor in Qin’s rise and eventual triumph, they influenced Chinese history to a remarkable extent. And in the light of all that has been discussed, it is clear that their impact certainly did not end there.

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Figure 1: Goodrich, Chauncey S. (1984), "Riding Astride and the Saddle in Ancient China", in *Harvard Journal of Asiatic Studies* 44 (2), p. 306, Plate 1.

Figure 2: Goodrich, Chauncey S. (1984), "Riding Astride and the Saddle in Ancient China", in *Harvard Journal of Asiatic Studies* 44 (2), p. 307, Plate 2.

Figure 3: Rolle, Renate (1980), *Die Welt der Skythen. Stutenmelker und Pferdebogner: Ein Reitervolk in Neuer Sicht*. C. J. Bucher, p. 64.

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Abstract

This thesis examines the contacts of pre-imperial China with the outside world, in particular with the peoples of the steppes to its north and west, and their impact. The history of China before the opening of the Silk Roads during the Han dynasty has, in the past, mostly been treated as having evolved in isolation from the western parts of the continent and independently from any outside influence. However, this view is challenged by scientific findings that show that China was maintaining regular contacts with the peoples of the neighboring Central Eurasian steppes from as early as the 2nd millennium B.C. While trade was the main motivation behind these interactions, they also ensured that many important material as well as conceptual revolutions entered China. It is now largely uncontested that the domesticated horse and the war chariot, both innovations that greatly transformed warfare and society in ancient China, were transmitted to the Central Plains via the steppes. During the Warring States period, the era marked by war and turmoil that preceded the first unification of China in 221 B.C., two very important innovations again changed the face of military endeavors and of China's political landscape and society: iron technology and cavalry warfare. While there is little doubt that horseback-riding was adopted, this work argues that iron technology likewise was imported via interactions with the Central Eurasian peoples, and therefore two of the most important innovations of the time were direct results of China's contacts with the steppes. Following this, the significance of these innovations is analyzed by looking at their role in the outcome of struggles and wars and their general impact on the distribution of power in this era of political turmoil. In the course of this analysis, it can be seen that many developments would seem to have been significantly conditioned by access to innovations or the lack thereof. Most notably, the ultimate outcome of the Warring States' struggles, i.e. the eventual domination by the state of Qin and its subsequent unification of China, was to a degree affected by the fact that Qin was, for geographic and cultural reasons, able to more easily access and integrate those new technologies from the steppes.

Zusammenfassung

Die vorliegende Arbeit behandelt frühe Kontakte zwischen dem China der späten westlichen Zhou-Dynastie, insbesondere der Zeit der Streitenden Reiche (Zhanguo), und den benachbarten Steppenvölkern, sowie einige Innovationen die China durch diese Kontakte erreichten und deren Auswirkungen auf die politischen und sozialen Entwicklungen dieser Periode. In der Vergangenheit wurde Chinas Geschichte vor der „Einigung“ unter Qin gerade von sinologischer Seite häufig in Isolation von der Geschichte des restlichen Eurasischen Kontinents betrachtet – die Validität dieser Sichtweise wird jedoch schon seit langem durch archäologische Daten in Frage gestellt, die deutlich reguläre Kontakte schon zwischen den frühen, vorgeschichtlichen Chinesen und der Welt „außerhalb“ zeigen. Obwohl diese Kontakte ursprünglich meist von merkantilen Beweggründen getrieben waren, führte der Handel physikalischer Güter auch zum Austausch von weniger greifbaren Dingen, wie etwa kultureller Gebräuche, Religionen, Ideen, Technologien oder sogar Krankheiten. Während der Zhanguo-Periode erreichten einige sehr einschneidende Innovationen aus dem Westen die Zentralebenen Chinas: die wohl wichtigste Neuerung dieser Periode, die Eisenverarbeitung, eine Technologie deren Ankunft das Ende der chinesischen Bronzezeit einläutete, sowie das Reiten (von Pferden), insbesondere die Methode des berittenen Bogenschießens, mit der zum ersten Mal die Kavallerie in chinesischen Armeen etabliert wurde. Die vorliegende Arbeit nimmt zunächst in Angriff zu zeigen dass beide Innovationen aus den Steppen übernommen wurden und somit eine direkte Folge von Chinas Kontakten mit der Außenwelt darstellen. Im Anschluss werden die Auswirkungen dieser Innovationen, sowie im weiteren Sinne die Auswirkungen der Kontakte mit den Steppenvölkern im Allgemeinen, auf die Streitenden Reiche, d.h. auf den Ausgang von Konfrontationen und sonstige Entwicklungen, diskutiert. Im Laufe dieser Diskussion zeigt sich dass der Zugang zur Steppe und somit enge Kontakte über die Grenzen hinweg, sowie alle Vorteile die sich daraus ergaben, in der Tat das Potenzial hatten große Veränderungen herbeizuführen und die Entwicklungen dieser Zeit maßgeblich zu beeinflussen. Schlussendlich wird ersichtlich dass sogar der endgültige Ausgang der Zeit der Streitenden Reiche, also der Sieg Qins über seine Rivalen und die darauffolgende Einigung Chinas unter dessen Zentralherrschaft, von eben diesen Faktoren beeinflusst wurde.

Lebenslauf
Christine Hofmann

Persönliche Angaben

Name	Christine Hofmann
Anschrift	Görgengasse 6/2/1 1190 Wien
Email	sinahofmann@gmail.com
Geburtsdatum/-ort	11. März 1985, Amberg (D)
Staatsangehörigkeit	deutsch

Akademische Ausbildung

10/2008 bis 4/2012	Masterstudium Sinologie an der Universität Wien
10/2005 bis 5/2008	Studium Sinologie an der Universität Wien Abschluss: Bakkalaureat
10/2004 bis 7/2005	Studium Sinologie und Anglistik an der Friedrich-Alexander-Universität Erlangen-Nürnberg (D)
09/1995 bis 6/2004	Johann-Andreas-Schmeller Gymnasium, Nabburg (Bayern, D) Neusprachlicher Ausbildungszweig Abschluss: Abitur

Auslandsaufenthalte

08/2009	3-wöchiger Sprachkurs in Qingdao, Shandong, China
09/2007 bis 12/2007	Auslandssemester am Qinhuangdao Foreign Language Professional College, Hebei, China

Sprachkenntnisse

Deutsch	Muttersprache
Englisch	verhandlungssicher
Chinesisch (Mandarin)	gute Kenntnisse
Französisch	gute Kenntnisse