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Consider the Qing Locust*

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Abstract: This article examines a 1761 locust eradication operation involving both Mongol and Han personnel, within a larger context of issues related to mutually conditioning relations between people, plants and animals. Such locusts outbreaks, as products of complex environmental relations still not fully understood, could provide unexpected opportunities for intense trans-Great Wall cooperation and bonding among groups often rhetorically and analytically separated by idioms of steppe and sown. Environmental interdependencies that emerge from these incidents may form the analytical basis for empire as a 'multi-environmental,' rather than as an anthropocentric multi-ethnic, construct in which ecological factors play a constructive role that is often inadvertent or unacknowledged.

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Locusts in the beginning will be harmless;
The barbarians from east and north near totally disappear.

蟲蝗初不害，夷狄近全銷。

(Xue Neng, *Ten poems in the ci-lyric style, to the tune of shengping, poem number six*)¹

These lines from a poem by the late Tang period scholar-official Xue Neng 薛能 (?-880) describe some of the harmoniously stabilizing effects on humans and ‘nature’ with the onset of sage rule, a classical theme of imperial Chinese ideology.² Also in keeping with this theme is the suggestion that locusts and non-Han Inner Asian peoples embody essentially similar external disturbances that are both equally susceptible to extraordinary rulership.

Although Xue Neng likely gave no thought to an Inner Asian conquest dynasty’s benevolent effects when he wrote his poem, the Qing (1644-1912), nevertheless, proved sagely beyond all conventional wisdom in the management of the environmental relations between people and ecology across its vast multi-ethnic empire that united Inner Asia and China proper. One dramatic manifestation of Qing rulership totally unimaginable in the poem, and in much of imperial ideology, is the act of Mongol cavalry riding to rescue Han-tilled fields just south of the Great Wall from several swarms of locusts moving in from the northern steppe. Nevertheless, at least one such event did occur, in 1761. In Xue Neng’s more traditional terms, at this date a dynasty ruled by “eastern barbarian” (*yi* 夷) Manchus did not disappear, but instead were able to employ “northern barbarian” (*di* 狄) Mongols to ensure that locusts could not even begin to threaten

¹ *Shengping ci shi shou* 昇平詞十首; *Zengding zhushi quan Tangshi* (2001), 4:2. Tang ci-lyric style was based on a limited number of conventional tunes (*cipai* 詞牌), about 800, that included the “tune of *shengping*” (*shengping yue* 昇平樂). Content was variable and often unrelated to a poem’s title, which was usually simply the name of the tune. In the case of Xue Neng’s poem cited here in part, however, title and content overlap. The term ‘*shengping*’ itself might be translated as ‘great peace rising,’ which alludes to the advent of a sage ruler whose benevolent influences are detailed in this poem’s lines. These influences may here repel both real locusts and corrupt officials, for whom the voracious insects were a common metaphor.

² Although, technically speaking, classical Chinese civilization did not have a concept exactly comparable to that of modernity’s ‘nature,’ the non-human world was well-integrated into both quotidian agrarian existence and classical ideology as ‘heaven and earth’ (*Tiandi* 天地). Furthermore, as most dramatically demonstrated by climate change, a civilization does not need to have an accurate concept of its ecological context in order to be affected by it.

“China proper” (called *shenzhou* 神州, or the ‘divine land,’ elsewhere in the poem).

This paper will examine the 1761 Mongol-Han locust eradication operation within a larger context of issues related to mutually conditioning relations between people, plants and animals. These interdependencies form the basis for empire as a ‘multi-environmental,’ rather than as an anthropocentric multi-ethnic, construct in which ecological factors play a constructive role that is often inadvertent or unacknowledged.

Before examining the 1761 operation in detail, it is important to clarify some key ecological factors, especially animals, as something other than purely human constructs. Instead, they constitute a substantial part of the ecological matrix to which people must adapt, which in turn results in environmental interrelationships of cultural and natural elements like the ‘Qing locust,’ herein. While ecological elements may be informed or affected by cultural constructs, complex phenomena like flora, fauna and climate cannot be so marginalized as to effectively leave humans in exclusive possession of the historical field.

Qualifying the Cultural Qualification of Ecology

There is a growing and understandable concern among the current generation of environmental historians to integrate their work into mainstream historical narratives, which may be summarized as ‘race, class and gender’ or ‘cultural’ themes.³ In many respects, this current trend is a logical and welcome development from an earlier period focused on simply legitimating environmental history, especially non-human, or what I call ‘ecological’ factors. Put almost too simply, the initial project of environmental history was the ecological qualification of culture; it seems increasingly now to be the cultural qualification of the ecology.

This more recent second-stage qualification work has helped to protect environmental history from the kind of crude environmental determinism that generally marred studies from the late nineteenth into the mid-twentieth centuries. This period of ‘high’ environmental determinism, however, has long passed. A more persistent issue has been a strong, even exclusive, emphasis on human agency as if it acts on an unquestioned passive nature.

Variations of this sort of emphasis are often critical components of the second-stage integration of environmental history, albeit in a more ecologically qualified tone. Some approaches, however, resurrect problems related to a kind of cultural determinism that much first-stage qualification

³ Isenberg (2014).

work was written to revise. For example, human-animal studies, or anthrozoology, emphasizes how humans “understand animals in the context of human society and culture ... how humans look at animals wherever they exist within the human world” and “how animals are socially constructed.”⁴ Understood in this fundamentally human cultural way, anthrozoology can be read as the kind of integration that is indistinguishable from incorporation; there is no genuine analytical room left for any significant acts but human ones.

This is not to argue that humans do not socially construct animals, but that the relations between humans and animals should not be reduced to social constructs. Among other problems, an anthropocentric concept of environmental relations ignores the significance that animal action can have on the formation of human identity and culture. As Brett L. Walker has recently argued, animals as predators on humans exercise an agency that “forces us to confront our shared fleshy nature with other organisms on Earth, which flies in the face of our deepest cultural myths.”⁵ Predators compel humans to face the myth of anthropocentricity as a purely cultural construct whose main function is to re-present the human/nature essentializing binary as ‘natural.’ Animal actions can limit, if not absolutely determine, human agency as well as alter the expression of that agency over time.

Such a consciousness-raising confrontation, however, need not exclusively occur between predators and their human prey, a situation that is, at any rate, comparatively rare.⁶ Herbivores are likewise quite capable of effecting even more complex transformational confrontations that reveal how humans are constructed and limited inadvertently through their

⁴ DeMello (2012), pp. 9-11. The diversity of anthrozoological work cannot be wholly reduced to the social construction of animals, but “by the 1980s, anthrozoology ... could be described as divided starkly between those interested in symbolism and communication structures and those focused on the economic and ecological underpinnings of social life;” Mullin (2013). I am here concerned with mostly addressing the considerable work on symbolism and communication as well as much of the work done in the economic realms.

⁵ Walker (2014), p. 62.

⁶ In many areas of the world where development is affecting habitat to an unprecedented degree, such attacks nevertheless can be common, even quotidian. For example, over the 1,443 days between April 2014 and May of 2017, 1,444 people were killed by either tigers or elephants – hardly top predators – in India. A total of 345 tigers and eighty-four elephants were killed by humans during the same period; “Elephants and tigers kill one human a day in India, as growing population squeezes habitat;” *The Telegraph* (2014). Such space-driven dynamics between Chinese peasants and tigers were happening long before industrialization in places like late imperial Fujian; Hambleton (2013), pp. 103-120.

relations with both animals and plants. This article considers one such example, conflicts between multiethnic humans and locusts over cultivated fields along the forest-steppe ecotone (transition area) where north China merges with Inner Mongolia. Under historically unusual conditions of the Qing state's unification of China proper with Inner Asia initiated in the mid-seventeenth century, Han Chinese and Mongolian groups enjoyed dramatically greater, if not entirely unrestricted, opportunities to interact across the ecotone they straddled. This included the relatively understudied phenomenon of interethnic cooperation for the control of natural disasters, exemplified here in the 1761 locust outbreak that mobilized a joint eradication operation by both Han and Mongols.

In this case, locust swarming behavior, encouraged both by human agricultural activities and favorable ecological conditions, affords an opportunity to observe Han-Mongol relations in response to insect action. Although, as the first section below makes clear, imperial Chinese culture certainly did construct locusts in quasi-metaphysical anthropocentric terms, this construct was likewise influenced by locust behavior, whose relevant biological dynamics are outlined in the second section. The third section presents a narrative, centered on Manchu archival sources, of the 1761 infestation, that provides a historical example of the 'multi-environmental' implications of this influence within the larger regional context of Zhili's forest-steppe ecotone. Locust behavior and the Mongol response to it in mounted defense of Han cereal cultivars shows how borderland space cannot be exclusively defined by interethnic contacts. Instead, such space should be analyzed as an environmental network, which includes connections to domesticates, like crops and horses, as well as to wild insects, that inform relations between people in a mutually conditioning way.

The Anthrozoological Locust

Consider the Qing locust, for example, but not just as a social construct of China's last dynasty. It is certainly quite possible to make an anthrozoological study of the locust as an imperial Chinese construct. One of the more obvious inquiries in this direction would be the ritual practices to deal with locusts that have existed throughout China's recorded history.⁷ These include assertions of conflicting social constructions of peasants and

⁷For a historical overview, with a special focus on the Qing period, see Kolb (2004).

official elites, which began to diverge during the Tang dynasty (618-907).⁸ Peasants regarded locusts as manifestations of divine power with which none should interfere. Officials came to regard them as pests to be exterminated, although they nevertheless sought divine assistance for this endeavor through various ritual practices that were considered orthodox.

These tensions were expressed in exemplary, if biased, fashion in Chen Chongdi's 陳崇砥 (1826-1875) 1874 *Manual on locust control* (*Zhihuang shu* 治蝗書):

As immature locusts begin to develop, all the villagers exclaim that they are numinous insects. So, they all, in mutual abstention, dare not catch them for fear of incurring the spirits' wrath. Thus, [the locusts] steadily spread in a way difficult to plan for, and so their harm is truly great. Although one tries to catch them, can this ever be done? Only those who think insects cannot be eradicated talk of spirits!

How can there be a spirit that gives free reign to the insects to do harm? How is giving them free reign to do harm in any way able to be called acting like a spirit! The *Liji* quotes the sacrificial prayers of the eight sacrifices to the spirits of agriculture as follows: "there can be no outbreak of insects," which means praying to the spirit to control the insects so that there is no outbreak.⁹

⁸ Yao Chong 挑崇 (651-721) successfully, and famously, overcame both elite and peasant religious objections to state eradication of locust outbreaks to inaugurate institutionalized locust control measures that formed the basis of all subsequent dynastic policies; Rothschild (2012). It should be noted that continuities in locust eradication or any state policies or social practices emphasized here do not constitute an argument for a more general monolithic lack of change characterizing the whole imperial period. State locust eradication policies and measures certainly changed over time; nevertheless, these changes tended to augment existing practices rather than replace them. In turn, not all localities at all times viewed locusts as untouchable. Seventeenth century peasants in the Jinan region of Shandong were reputed, for example, to eat locusts; "Tiaochen buhuang zhuo gui jianyi shu," 2:1070b-73a. Religious taboos nevertheless clearly remained in force in many locales to the frustration of officialdom.

⁹ The eight spirits of agriculture were worshipped in eight distinct rituals from antiquity. The eighth deity, Kunchong 昆蟲 (The Insect), protected the harvest from infestation. The *locus classicus* for the ritual, which does not include The Insect as one of the eight spirits, is the *Liji*; see *Liji yizhu*, pp. 316-317. The Han scholar Zheng Xuan's 鄭玄 gloss on this passage, however, includes The Insect as one of the eight spirits; *Shisanjing zhushu*, 2:1453c.

The Father of Husbandry is a spirit.¹⁰ The *Shiji* says that “thus the father of husbandry is greeted as a guest.” It also says:

May the Spirit, the Father of Husbandry,
Lay hold of them [insects], and put them in the blazing
fire!

This says that the Father of Husbandry’s ability to get rid of insect pests, makes him a spirit. Now, to say that insects can be spirits; is this not extremely foolish! So, spirit tablets must be set up to expel locusts and ward off natural disasters. By this means will superstition be eradicated, which is no more than the doctrine of ‘instruction through the Way of the spirits.’¹¹

蓋螭之初生，鄉人皆呼爲神虫，恐于神怒，咸相戒不敢撲打，漸至滋蔓難圖爲害實甚，雖欲撲之，其可盡乎。獨不思能除蟲者，謂之神，豈神也，而縱蟲爲害耶。縱蟲爲害，豈猶得稱爲神耶。八蜡神也，禮之祝蜡日，昆蟲毋作，此祈神以制昆蟲之不作也，田祖神也，禮曰以迓田祖，又曰田祖有神秉畀炎火，言田祖能去螟蟊蠹賊，方爲有神也。今謂蟲爲神何愚之甚乎。故必安設驅煌捍災神位以祛其惑，亦神道設教之說也。¹²

Chen went so far as to advocate the establishment of one or more ‘works’ (*chang* 廠) near locust infestations to act as onsite ritual stations to mobilize locals for effective eradication operations. In addition to centrally organizing, equipping and dispatching locust control groups, these works would effect and maintain the official consensus on locusts as spiritual constructs throughout the affected communities:

¹⁰ Tianzu 田祖, the “Father of Husbandry,” is another name for Shennong 神農, the divine founder of agriculture in Chinese myth. The line from the *Shiji* is slightly misquoted here. The original text is: [With lutes, and with drums beating,] “We will invoke the Father of Husbandry” (*yi yu tian zu* 以御田祖); *Shisanjing zhushu*, 1:474b. Chen’s version may come from *Jinshu*; 3:676.

¹¹ ‘Instruction through the Way of the spirits’ (*Shendao shejiao* 神道設教) appears in a line from the *Book of Changes* entry for the hexagram ‘contemplation’ (*guan* 觀) which refers to how a sage uses his knowledge of the divine to instruct the populace; *Shisanjing zhushu*, 1:36b.

¹² *Zhihuang shu*, pp. 5a-b. Despite this work’s relatively late appearance, most of the general concepts and eradication practices it describes date from long before the late nineteenth century. For an influential and relatively comprehensive late Ming compilation of locust control, see *Nongzheng quanshu jiaozhu*, pp. 1299-1307. For a historical survey of locust control works from the Song to the Qing, see Peng (1982); for a publication history focused mainly on Qing works, see Xiao (2007), pp. 173-76.

Within the works, “drive out locusts and ward off disasters” will be written in big characters on the yellow paper of spirit tablets and stuck to the walls. Incense benches will be installed, and officials will burn incense once and every local person of standing will do likewise once per day. Morning and evening drums and gongs will sound to assemble a crowd to ready themselves at a single point. They will make every effort to catch and eradicate the locusts. Finally, there will be arrangements for offerings. The whole village will come together to burn incense and the yellow paper.

廠中用黃紙大書驅蝗捍災之神位，粘於壁間，安設香案，官爲拈香一次，各紳董每日拈香一次，早晚鳴鐘集眾點齊，赴地撲滅，後即備辦供品，合鄉拈香將黃紙焚化。¹³

An anthrozoological consensus may also have been reached at this point as locusts emerge in Chen’s text as essentially, if not uniformly, socially constructed. Peasants construe locusts as spiritual manifestations; officials as mundane pests who threaten grain, but are nevertheless vulnerable to spirit intervention in the process of eradication operations. The foundations of the peasant construction that in turn constructs the official reconstruction, however, rests upon a distinctive aspect of locust biology, namely phenotypic plasticity. It is in this respect that the biology of insect behavior must inform the anthrozoology of insect representation, to produce a less anthropocentric, and so more environmental, analysis of relations between locusts and people.

The Plastic Locust

Phenotypic plasticity in simplest terms is manifested by a physical or behavioral change, conditioned by genetic factors, in response to changes in surroundings. More technically, it can be defined as “the capacity of a single genotype to exhibit a range of phenotypes in response to variation in the environment.” While all living things to some extent exhibit phenotypic plasticity, some life is much more ‘plastic’ than others.¹⁴ One of the more extreme examples in nature is the transformation from caterpillar to butterfly. Another, more pertinent, example is the series of physical transformations that locusts undergo from wingless, solitary individuals that wriggle and hop to flying swarms.

¹³ *Zhihuang shu*, pp. 7b-8a.

¹⁴ Whitman and Ananthakrishnan (2009), pp. 4-5.

Only a very few species of grasshoppers (less than twenty out of more than 12,000) undergo such a physical and behavioral transformation, which occurs in multiple stages that are not inevitably completed, to form locust swarms. It is only in the final stages, usually triggered by crowding, that wings develop and full-fledged locusts appear. Indeed, this transformation, a “potentially devastating form of phenotypic plasticity” called “density-determined phase polymorphism,” is the determining biological distinction between grasshoppers and locusts.¹⁵ Crowding is likely the most important prerequisite for the density-determined phase polymorphism that induces locusts to form wings, swarm and make history. Strictly speaking, locust phenotypic plasticity is not entirely ‘determined’ by ‘density’ alone, and its precise conditions are subject to ongoing research. Modern science has only recently traced the mechanisms of the chemical trigger for density-determined phase polymorphism in 2015. Serotonin, a neurotransmitter “strongly associated with how animals engage and cope with their social environment,” is produced in different amounts depending on an insect’s phase stage to induce swarming under the right external conditions. Nevertheless, while the sight and smell of other locusts under specific habitat conditions also contributes to locust formation, “the most powerful gregarising stimulus” is physical contact, most compellingly between touch-sensitive chemical receptors on the insects’ hind legs.¹⁶

Agricultural fields promote such prolonged physical contact as grasshoppers converge on attractive concentrations of palatable cereals that would not normally occur without human agricultural behavior. A 2002 study of *Locusta migratoria* in Algeria concluded that the introduction of irrigated agriculture in the Central Sahara region over the preceding twenty years had created a habitat to increase this main locust species by shielding it from adverse Saharan biotic and abiotic conditions. Even abandoned cropland afforded congenial alterations for locusts in some otherwise hostile areas. The presence of certain plants, including sorghum, significantly enhanced locust population density in agricultural plots. Locusts tend to be attracted to grasses, from which cereal cultivars were modified by farmers over many centuries, because these plants lack chemical deterrents to grasshopper species.¹⁷ North China and Inner Mongolia’s main pest, *Locusta migratoria migratoria* (the Eurasian migratory locust), does not have to contend with the Sahara desert, but other

¹⁵ Simpson and Sword (2008), pp. 364.

¹⁶ Rogers and Ott (2015), p. 1; Simpson and Sword (2008), p. 365.

¹⁷ Benfekih *et al.* (2002), pp. 243, 247, 249.

conditions, like the presence of sorghum as a major crop, are similar to those in northern Africa.¹⁸

In Africa and China farmers expand habitat that does not simply feed grasshoppers, but also crowds them into locust swarms. As I have argued elsewhere, the agriculture of 'imperial arablism' was deliberately employed by the Chinese dynastic state to construct a particular human identity, predicated on a relationship to particular plants, that would produce both a stabilizing cereal surplus as its main revenue source and a congenial type of person as an ideal imperial subject.¹⁹ Moreover, agriculture can inadvertently transform insect 'identity' in a way that constitutes an existential threat to farming's main human identity constructs, Han peasants.

The significance of the phases of density-determined phase polymorphism was appreciated by Chinese statecraft authors, whose views doubtlessly reflected direct experience. Chen's manual exhibits a clear recognition of how critical these stages of development are for effective locust control.

All methods of controlling them must be divided into three stages: [when] they are eggs that have yet to hatch; [when] they hatch as immature locusts; [when] they grow wings to become locusts. To control locusts is not as easy as controlling immature locusts, which is, [in turn,] not as easy as controlling the eggs. Likewise, controlling them after a drought has already developed is not as easy as controlling them when floods recede. This also is no more than clearing them out at their source. Thus, it is said that the offspring of locusts begin in water and mature in drought. Those who are concerned to deal with this distress of the people should do so in its early stages.

凡治之之法須分三等，未出爲子，既出爲蝻，長翅爲蝗，治蝗不如治蝻之易，治蝻不如治子之易。然治之於旱象已成之後，又不如治之於水潦方退之時，亦清夫其源耳。故曰蝗蝻之患始於水，而成於旱。留沁民隱者辨之，宜早辨也。²⁰

¹⁸ Zhang and Kang (2005), pp. 1-14. North China is a subspecies boundary that contains both *L.m. migratoria* and *L.m. manilensis* (the Oriental migratory locust), whose habitat is delineated by the generally warmer temperatures of southeastern Asia, including east China. This temperature gradient that increases from north to south creates conditions for more frequent broods of *L.m. manilensis* and lower cold tolerance of its eggs and hatchlings; Wang and Kang (2003), pp. 331-332.

¹⁹ Bello (2016), pp. 40-48.

²⁰ *Zhihuang shu*, p. 2a-b.

Here, Chen also recognizes the role of climate for the formation of habitat conducive to locust reproduction. As the passage suggests, locusts can indeed be linked with climate extremes. Recent research has shown that drought can induce the desert locust *Schistocerca gregaria* to undergo density-determined phase polymorphism in behavioral response to habitat contraction. This species of normally solitary locust can be forced to congregate onto increasingly constricted patches of habitat, “triggering a profound alteration of behavior within just a few hours” as crowding stimulates leg receptors and ultimately send a surge of serotonin through their nervous systems to induce swarming.²¹

Consequently—and typically in terms of complex systems—human agriculture is not the only condition that promotes swarming; both expansion and contraction of habitat can produce swarming behavior. Most importantly, locust development is also critically determined by the interplay of other factors, such as climate and, especially, temperature. So, in the warmer southerly extremes of its range, *L. m. manilensis* can produce as many as four broods per year, while 1-2 is the norm in its more temperate northerly ranges, which center on the Yangzi and Yellow river deltas. *L.m. migratoria*, the main *Locusta migratoria* subspecies of Inner Mongolia, is likewise limited to one to two annual broods. The eggs and early phase offspring (instars) of *Locusta migratoria* species in general can adapt to regional subzero temperatures if only briefly exposed or exposed to gradually dropping temperatures.²² Both temperature and precipitation exert a definite influence, which, again, has unexpectedly complex dynamics. The alteration of flood and drought both generally increase locust breeding habitat, which can nevertheless be disrupted by unseasonal and excessive wet or dry spells. However, locusts can even offset some of these adverse effects through basking or speeding up their metabolic rates. So, temperature and precipitation, while certainly among the most fundamental factors, are neither the only, nor the absolute determinants of locust development, which can be substantially altered by the insects’ own adaptive responses to their surroundings, natural and anthropogenic.²³

There is some indication that locust outbreaks increase when temperatures are consistently low enough to effect an overall increase in drought and flood that leaves shorelines in a sufficiently damp condition for locust egg-laying without excess or insufficient moisture with the timely advance and retreat of water. There are regional qualifications to this pattern, most significantly in the lower Yangzi, where higher, rather than lower, temperatures probably promote flooding. Across China,

²¹ Rogers and Ott (2015), p. 1.

²² Tu *et al.* (2012), pp. 133-140; Wang and Kang (2003), p. 332.

²³ Stige *et al.* (2007), pp. 16188-16190; Tu *et al.* (2012), p. 138.

however, the main pattern of low temperature forcing of both drought and flood holds.²⁴ Some of these variations probably account for the fact that nearly 23% of incomplete records of Qing insect outbreaks occurred in the Yellow River delta in Shandong province, while just under 10% occurred in the corresponding delta of the lower Yangzi province of Jiangsu to the south.²⁵ There were, nevertheless, larger regional forces at work that probably increased insect outbreaks during the Qing to some of their highest historical levels.

The Qing experienced such generally cold and wet conditions in China proper during the so-called Little Ice Age (c. 1400-1900), which encompassed nearly the entirety of the dynasty's tenure. Between 1644 and 1839, for which incomplete statistics have been compiled, there were at least 527 insect outbreaks across the empire's eighteen core provinces of China proper. When compared to rates of previous dynasties, whose records are admittedly even more incomplete and problematic, the Qing appears to have had the highest dynastic rate of outbreaks. Late Qing reigns were subject to virtually annual outbreaks and during the 134 years of the High Qing reigns of Kangxi, Yongzheng and Qianlong (1662-1795), 112 years, or 83.5% of them, endured outbreaks somewhere in the empire.²⁶

Qualifications notwithstanding, there does seem to be a general consensus that wetlands are ideal locust early development habitat and that climate effects, namely flood and drought, were heightened during the Qing period in China proper that tended to expand this habitat over time.²⁷ Furthermore, re-establishment of cultivation in many war-torn areas in the wake of the 1644 Qing conquest, along with new agrarian clearance that spread into borderland areas in the eighteenth and nineteenth centuries should have likewise added nutritional and swarming habitat. Although these general historical conclusions may be subject to qualification under

²⁴ Stige *et al.* (2007), p. 16188; Zhang *et al.* (2009), pp. 823, 829. One pertinent qualification of these studies was that all historical records of insect outbreaks were assumed to refer to *L. m. manilensis*.

²⁵ Calculated from figures in Li (1995), p. 214.

²⁶ Li (1995), p. 214; Zhang (2008), p. 43. Of course, as a complex system in its own right, the Little Ice Age did not manifest itself uniformly over all of China. In comparison with the previous Medieval Warm Period (c. 1000-1300), eastern China proper—roughly east of 105° E—was relatively drier. Yet, within that general regional drying trend, the southern sub-region of eastern China—roughly south of the Huai River, was wetter than its corresponding northern sub-region; Chen *et al.* (2015), pp. 98-111. Of course, relative regional conditions of wet and dry may have stayed within the acceptable range of locust habitat requirements, with patchiness promoting more outbreaks in some areas than in others.

²⁷ Tu *et al.* (2012), p. 138; Stige *et al.* (2007), p. 16190.

dynamic environmental conditions, they are reasonably informed by current scientific understanding.

In more specific Qing regional terms, there is evidence that humans were actually helping hungry locusts to grow even as they produced more food for themselves. Northern Zhili prefectures of Rehe 熱河 and the 'Three Subprefectures North of the Passes' (Koubei santing 口北三廳) that overlapped into Inner Mongolian territories (the Chakhar banners and the Juu Uda and Josotu leagues) experienced significant expansions of cultivation, especially from around the mid-eighteenth century. Much of this migration appears to be driven by natural disasters in China proper that could send large numbers of desperate north China Han cultivators into adjacent borderlands with very disruptive effects unless some, preferably agricultural, livelihoods were quickly found for them. Guihua 歸化 experienced such a disruptive incursion of Shanxi 'hunger migrants' (Ma: *angga sulfame yabure irgese*) in the wake of a bad harvest in 1746. The solution in this instance was to round up the people who "swarmed the roads and streets, begging at the shops of Han merchants & Mongol homes and engaging in indiscriminate coercion" and send them back to their native Shanxi locales where they were expected to resume their farming.²⁸ In practice, however, repatriation to China proper did not always work so smoothly.

The alternative was for the state to sanction refugee incursions into steppe borderlands. This is partly how such areas became new homes for tens of thousands of Han settlers. In the Kharachin right wing banner zone of the Josotu league, for example, between 12,000 and 17,800 Han adults were probably cultivating between 2,800 and 4,500 *qing* (about 18,200 to 29,250 hectares) in 1748. By 1781, cultivation in Rehe prefecture was recorded as about 21,133 *qing* (about 137,365 hectares) cultivated by 284,515 adults.²⁹

The crops generally grown in fields beyond the Great Wall were largely 'coarse grains' (*zaliang* 雜糧), which included sorghum, glutinous millet and buckwheat.³⁰ Although it is impossible to ascertain precisely what sort of crops were grown precisely where at what time, there are some indications that glutinous millet (*shu* 黍) was a major staple crop. A 1747 Manchu report concerning aid to poor Mongols from the Chakhar banners just beyond the Great Wall in Koubei Santing refers to state grants of "glutinous millet from the storage granaries of their respective banner companies." The state would also provide them with seed to allow them "to cultivate fields selected from fertile bannerlands not being used to

²⁸ MWLF QL 11/4/19 [03-0170-0059-002].

²⁹ *Rehe zhi*, 5: 3091-3092, 3095.

³⁰ Zhu-sa (2009), p. 35.

pasture livestock.” Millet appears again as a state-distributed relief grain for a distressed Khorchin banner of the Jirim league in another Manchu report from 1733. A year previously, an inspection of Chakhar banner fields turned up a ‘large’ joint Mongol-Manchu farming operation of about 1,500 *qing* 頃 (that is, about 10,000 ha) that was growing glutinous millet and buckwheat ‘Chinese style’ (Ma: *nikarame usin tari[ngge]*).³¹ Millet was clearly not only being cultivated, but grown in sufficient quantities to stockpile it for disaster relief.

Current research suggests millet was a staple for locusts as well as for humans in the region. Millet has been found to be a major source of locust nutrition in at least one species, the desert locust. A study conducted between 1999 and 2002 in Sudan showed that the desert locust preferred a millet habitat. Millet, a regional staple crop in Sudan, has been found to be “among the best food plants for . . . the development and survival” of immature locusts and for “adult reproduction and longevity.” The Sudan study found millet to be one percent richer in nitrogen compared to the surrounding low-nitrogen plant community, and “such a difference is likely to have a considerable effect on the survival and fitness of locusts.”³² A laboratory study of the nutritional effects of millet (*Pennisetum typhoideum* Rich.) leaves of varying nitrogen content on desert locusts revealed the effects of millet in greater detail. Locusts reared on the higher nitrogen diet developed faster and reproduced earlier than those fed on lower nitrogen content leaves. Considerably more of the high nitrogen-diet locusts also lived to the adult stage (ninety-two percent as opposed to sixty-four percent) and produced many more offspring (sixty-five as opposed to twenty per female) once they had reached it.³³

³¹ MWLF, QL 12/1/22 [03-0173-1082-001]; MWLF YZ 11/7/1 [03-173-1032-016]; MWLF, YZ 10/10/2 [03-0173-1027-010]. There are ambiguous references to *mai* 麥 (Ma: *maise*) in both the Chinese and Manchu regional record that might refer to wheat (*xiaomai* 小麥), but more likely refer to barley (*damai* 大麥). *Maise* of some sort was being harvested in the Chakhar banner jurisdiction of Guihua in 1735, for example; MWLF YZ 13/7/8 [03-0172-0600-003]. Chengde 承德 prefecture was planting some, but “not much,” “spring *mai*” (*chunmai* 春麥) in 1807 and an 1829 report asserts that the cold temperatures in Chengde and elsewhere “beyond the passes” precluded the cultivation of “autumn *mai*” and restricted the planting of “spring *mai*” to “no more than ten percent;” *Qingdai zouzhe huibian: nongye, huanjing*, pp. 354, 430. There certainly were, as one 1770 report makes clear, substantial areas in Zhili where neither wheat nor barley was planted; *ibid.*, p. 237.

³² Van Der Werf *et al.* (2005), p. 995.

³³ Woldewahid (2003), p. 111. There has been more recent work suggesting that some species of steppe locusts, most notably *Oedaleus asiaticus*, actually thrive on nitrogen-poor crops; Cease *et al.* (2012). So far, however, such adaptation seems to be characteristic of more sedentary versions of species like *Oedaleus asiaticus*.

Although I have found no comparable studies for the Eurasian migratory locust, work on the desert locust nevertheless suggests how the mid-eighteenth century intensification of agrarian clearance along northern Zhili's agro-pastoral ecotone could have inadvertently transformed tens of thousands of hectares of comparatively low-nitrogen grasslands and forests into high-nitrogen field habitats for growing locusts. Such complex environmental processes like locust development cannot, of course, be reduced to a single cause. However, overall environmental conditions in many areas of north China and its Mongolian hinterland indicate that locusts benefitted not only from ecologically favorable conditions of climate and topography, but from political conditions in the wake of the Qing conquest that secured the frontier between Inner Asia and China proper for larger-scale Han migration and, therefore, agrarian development.

Ecological processes associated with locust habitat formation and expansion likewise inform Chen's account, which includes an overview of previous experience accumulated over many centuries, of how locusts come to be. Chen, however, shows how further anthropogenic modification of ecological conditions—extreme deforestation—beyond the immediate confines of grain fields could be triggered, in turn, by locust outbreaks. This expansion of contested terrain was not necessarily suited to crops, but nevertheless abounded in wingless grasshoppers wriggling and hopping around in earlier instar stages.

Chen went so far as to advocate what amounted to a scorched earth policy of locust reproductive habitat, especially wetlands, in the vicinity of fields, advising that they be denuded of vegetation and burned off.³⁴ The extent to which such extreme proposals were actually put into practice is unclear, but there is some evidence that limited forms of deforestation were actually deliberated and implemented to eradicate locust habitat preemptively.³⁵ These somewhat drastic acts were mainly committed in response to locust phenotypic plasticity. Qing locust control authors clearly recognized the critical significance of phenotypic plasticity for their strategic proposals by holding it was generally easiest to eradicate locust

Another article by some of the same group of authors found that migratory locusts, like *Locusta migratoria*, required higher nitrogen diets because their "more active" and "higher metabolisms" enabled them to fly longer distances; Cease *et al.* (2017). It may be best to conclude, as another recent study of *Oedaleus asiaticus* did, that "the ease and regularity by which individuals shift phenotypes [physiological manifestations of genetic codes like transformation of grasshoppers into locusts] . . . suggests that populations consist not of similar, fixed phenotypes, but of a collection of ever-changing, divergent phenotypes;" Huang *et al.* (2017), p. 1.

³⁴ *Zhihuang shu*, p. 9a.

³⁵ For an example, from Zhili, see *Gongzhong dang Qianlong chao zouzhe*, QL 28/7/27, 18: 564b-66a.

eggs, then eradicate immature locusts and, finally, most difficult to wipe out winged insects.³⁶

Indeed, throughout the writings on locust control, human relations with locusts, whether elevating them to divine status or targeting them as pests, are significantly conditioned by locust biology and not entirely by human imagination or interest, regardless of the authors' degree of understanding of locust behavior. This fact, however, does not define locusts as distinctively Qing, although they do take on a particularly Chinese identity as subjects of the Locust God's authority or as sacrosanct manifestations of divine displeasure. A subject identity is, nevertheless, imposed arbitrarily by humans. One instance when locusts clearly exercised much greater initiative to condition human interrelations occurred during the summer of 1761 along the empire's Great Wall forest-steppe ecotone. The dynastic significance of what was likely *L.m. migratoria* becomes visible as Han peasants and Mongol cavalry unite to halt a steppe swarm moving south into cultivated fields of China proper.

The Qing Locust

Over the sixty-year Qianlong reign (1736-95), there were at least 112 locust outbreaks recorded somewhere in China proper or Manchuria, with the plurality, about thirty-five percent of them (thirty-nine incidents), occurring in Zhili.³⁷ The precise record for Inner Mongolia, which during the Qing was an imperial territory split between multiple Mongol enclaves that included the Forty-nine Banners of the Six Leagues, the Tümed of Guihua (present-day Hōhhot) and the Pastoral Chakhar, is much more difficult to distinguish.

This is mainly because of the mosaic of ethnic administrations for Mongols and Han resident in the region. Like Shanxi, its provincial neighbor to the west, Zhili's administrative jurisdiction straddled the Great Wall, with some China proper administrative units extending northward into grasslands where multi-ethnic agro-pastoral practices were common. Koubei santing and Rehe prefecture were technically administrative units of Zhili in China proper, but contained vast herding and hunting zones under Inner Asian military jurisdictions of the state and royal house.³⁸

Much of the prefectural infrastructure had been laid down in the 1720s and 1730s to manage influxes of Han settlers numbering in the tens of

³⁶ *Zhihuang shu*, p. 2b.

³⁷ Li (1995), p. 190. The next highest incidence was in Jiangsu, a distant second with only sixteen percent (eighteen incidents); *ibid.*

³⁸ *Koubei santing zhi*, pp. 22a-23b, 103b-113b; Niu (1990), pp. 7, 9-10, 15-16.

thousands. As a result substantial parts of the region were undergoing significant environmental transformations from, broadly speaking, Mongol pastoral to Han agricultural zones. Bagou 八沟 subprefecture is outstanding in this respect. The main theme of the Qianlong emperor's 1783 poem, "Country Inns" (*Ye dian* 野店), commemorates the cultural and ecological conversion of Bagou:

In the past, originally Mongol pasture lands;
Now are become fields for Han commoners' plowing and well-boring.
Places newly prefected and newly districted;
Nearly rich enough as all the more suited to commerce.

昔原蒙古牧游地，今作齊民耕鑿場，郡矣縣之新創建，
庶乎富也更應商。³⁹

Originally a Khorchin Mongol herding area, Bagou had become substantially agro-pastoral by the Yongzheng reign (1723-1735), where officials, as the emperor's gloss on his poem stated, "managed the affairs of banner people and Han commoners" within a subprefectural structure set up in 1729. The subprefecture (*ting* 廳) had "nourished" both groups to the point where it had become "densely populated," with "millet-filled fields no different from that of China proper." In 1778 Bagou was redesignated the department (*zhou* 州) of Pingquan 平泉 under Chengde prefecture, which had been raised from a subprefecture the previous year. This process of establishing a new addition to the existing system of provinces, prefectures and districts—traditionally abbreviated as *junxian* 郡縣—defined China proper in primarily Han ethnic-administrative terms.⁴⁰

Although the establishment of subprovincial units beyond China proper appear as administrative changes, they actually reflect much more fundamental changes in people's relations with their surrounding ecologies, which, in forest-steppe ecotone areas of Zhili like Bagou meant a shift from mainly pastoral to mainly agricultural practices. This does not mean, however, that such relations were absolutely ethnically determined, with Mongols exclusively herding and Han exclusively farming. As the emperor's own account indicates, Bagou went through an agro-pastoral transition period before the emergence of what appears in the poem as a—doubtlessly exaggerated—ubiquitous agriculture. It is certainly clear from a range of sources, imperial poetry included, that many Mongol groups had engaged in agro-pastoral relations for generations, but Han observers considered Mongols in general as naturally pastoralist.⁴¹ Moreover, the Qing state during the eighteenth century actively promoted the

³⁹ *Qing Gaozong yuzhi shi* (2000), 14: 282a-b.

⁴⁰ Niu (1990), p. 10.

⁴¹ For a discussion, see Bello (2017), pp. 240-251.

preservation of their herding lifestyles, which even at this relatively early period had begun to come under Han agrarian pressure.

So, in an increasing number of locales, Mongols, mainly pastoral, were living more closely to Han, mainly agricultural. Moreover, in some areas like Bagou, there was some degree of multi-environmental agro-pastoral intermixing. These circumstances could certainly produce inter-ethnic tensions and conflict, which was the abiding concern of regional imperial administrators, who often stressed genuine incompatibilities between Mongol herding and Han commercial agrarian practices—even when the latter included pastoral elements. Official supervision of diverse groups in close proximity with overlapping environmental relationships could be quite complicated.

In 1748, for example, a Manchu report complained of the arrival of over 10,000 Han refugees flowing into Bagou in flight from a drought in Shandong. Many were seeking out shelter with relatives who were locally established. Officials feared such a large influx, which raised the resident Han population by about ten percent to almost 120,000, would result in “disruptive incidents” with local Mongols. They were also worried that an increase in the locale’s military garrison required to keep both populations separate would “put pressure on” Mongol “pastures to the detriment of their way of life.” Local Mongols had affirmed in an official petition that “since very many Han have now arrived here, we have become stained with their customs and fear our old ways will be abandoned. Should garrison troops be added, we fear they will occupy our livestock herding areas.” No extra troops were added, but an official from the Lifanyuan 理藩院 (Court of Territorial Affairs) was installed to handle Mongol-Han relations.⁴²

It is undoubtedly the case that the multi-environmental conditions of the empire’s steppe borderlands created inter-ethnic tensions. It is less evident, however, that some common ground shared between these same conditions could form the basis of inter-ethnic cooperation based on shared interests. There are, nevertheless, some instances in the historical record that reveal just such a common ground, and several of these that have come to light are in response to locust infestations, which were quite indiscriminate in their predilections for grain and fodder. In the fall of 1760, for example, the throne received a report that “flying locusts” (*feihuang* 飛蝗) had appeared in various locales beyond the Great Wall and were flying northeast towards it. They had not yet crossed into China proper and efforts were being made to intercept the swarm before it could enter. Nevertheless, the report’s sense of urgency was not restricted to the grain fields south of the Great Wall:

⁴² MWLF, QL 13/2/20 [03-0170-0061-002].

Although these locales are beyond the passes, they are all areas with crops no different from locales within the passes. So, there can be no slackening in their location and eradication just because they have not yet passed the border [into China proper] . . . Furthermore, the locusts in this locale, because they are flying to the northeast, it is feared that they will inevitably go to ground in Tazigou, Bagou and other locales in Rehe beyond Gubeikou that all have congenial areas [for locusts] . . . If flying locusts have gone to ground [anywhere], maximum effort must be made for their eradication to prevent the slightest residual potential for calamity.

該處雖系口外然是處皆有莊稼与口內無異。不得以飛蝗未及進邊遂稍弛搜撲 ... 再該處飛蝗、既向東北飛去。則古北口以外如熱河塔子溝、八溝、等處。皆適當其地 ... 倘有飛蝗停落。務當盡力撲滅。不使稍留餘孽。⁴³

Another apparently separate swarm had formed in wetlands in Tumed Mongol areas to ravage crops in Shandai 善岱, about sixty-five kilometers from Guihua and was heading southeast towards Xuanhua 宣化 prefecture in Zhili, south of the Great Wall. Officials were likewise put on alert there.⁴⁴ Locust control measures appear to have been successful. A subsequent report covering grain areas in various jurisdictions of Rehe, “Mongolian localities” and “four banner” military zones in Bagou subsequently declared a bountiful harvest for 1760.⁴⁵

It is evident from these reports that by 1760 there was enough grain production across areas of northern Zhili and central Inner Mongolia to warrant the interest of locust swarms that caused serious alarm of officials from multiple jurisdictions. Although it is not precisely clear whether the fields under threat were Mongol or Han, their protection required cooperation of jurisdictions that stretched from Inner Mongolia into China proper. This cooperation is all the more interesting in light of a 1770 memorial from metropolitan censor Dou Guangnai 竇光鼐 (1720-1795), who was reconsidering locust eradication measures in Zhili that had been proposed a decade earlier by the province’s Governor-General Fang Guancheng 方觀承 (1698-1768). Both Dou and Fang were wrestling with one of the ‘classical’ problems of locust eradication, namely, how to mobilize busy local farmers in sufficient numbers quickly enough to stop locust swarms that could quickly spread over large areas. Dou observed that, among several problems, Fang’s proposal required too many people to patrol for locusts and too few to employ in eradication operations.

⁴³ *Qingshilu*, QL 25/7/1, 16:926a.

⁴⁴ *Qingshilu*, QL 25/7/1, 16:926b.

⁴⁵ *Qingshilu*, QL 25/7/n.d., 16:1005a.

Moreover, the numbers of people involved would require the population from “several tens of villages” and “those far away would not be able to arrive promptly.” Finally, people from multiple jurisdictions would be deployed. This could complicate command and control because “banner people,” sent from regional manors maintained directly by the throne, “would not be ruled by local officials” in charge of districts and prefectures as part of the separate provincial bureaucracy lacking authority over crown lands. Dou stated that, of all Fang’s proposals, he “would choose to eliminate only the item concerning banner people and commoners working as one to catch locusts as the main problem with his [Fang’s] methods.”⁴⁶

The 1760 eradication operations show trans-border multi-ethnic cooperation primarily as the relay of information about swarm location rather than actually getting rid of the locusts, an action that Dou’s 1770 memorial suggests would be conflicted. However, the 1761 operation, supervised by Chakhar Plain Red Banner Superintendent (Ma: *Gulu fulgiyan gūsa uheri da*) Ciriktai (n.d.) involved a more comprehensive, if likewise somewhat conflicted, degree of cooperation between Mongol troopers north of the Great Wall and Han civilians south of it that combined aspects of both warning and eradication.⁴⁷ While this incident certainly shows the difficulty in coordinating effective joint eradication operations between jurisdictions and ethnic groups, it also shows that cooperative efforts were possible and could be made more effective simply by better communications.

The throne first learned of the insect incursion when Ciriktai submitted a terse preliminary report from a subordinate in his jurisdiction just north of the Great Wall passes in Chakhar Mongol territory. This report stated that “towards twilight, suddenly swarms of locusts flew in. I have no idea where they came from.” Ciriktai, probably realizing that the locusts had reached their most unmanageable and destructive stage of development acted immediately by dispatching an officer to reconnoiter the situation. Once his scout reported that the insects “resemble those locusts that harm China proper’s fields,” Ciriktai’s response was a distinctively Qing one:

Although this swarm of locusts doesn’t affect our
Mongolian steppe, should it reach China proper, the
swarm is likely to devastate Han cultivated fields . . . [So,]
I myself took a considerable number of troops to places

⁴⁶ “Tiaochen buhuang zhao gui jianyi shu,” pp. 2: 1077a-1088b.

⁴⁷ I have briefly summarized the 1761 operation, which I erroneously dated as 1765, in Bello (2016), pp. 21-22.

where there are locusts to make every effort to eradicate them.⁴⁸

There are likely very few points in imperial Chinese history when mounted Mongol troopers would have ridden out from the steppe in defense of Han fields far to the south. The Qing period, however, was the longest and most enduring of these points of comparative multi-ethnic cooperation across the Great Wall. There were many ‘human’ reasons for this, from Manchu-Mongol marriage ties to Inner Asian diasporic populations taking up residence in Han towns. Ecological actors, however, also played a meaningful, if not very well-recognized, role in helping to bind these human ties.

Admittedly, these relatively ungovernable factors could fray ties as well. Indeed, at one point during the operation, Ciriktai’s precision tactics were disrupted by the unexpected arrival of one of his Han counterparts from across the wall in Shanxi province. As his cavalymen were driving the swarm away towards the north, the prefect of Ningyuan 寧遠, leading “several hundred Han” suddenly appeared and began to sweep the locusts back towards the south. As a result of this untimely and inexpert intervention, “the locusts all flew about randomly everywhere, with the result that the swarm is now quite near the Han cultivated fields.” Ciriktai was compelled to redeploy his troops and coordinate them with other

⁴⁸ MWLF, QL 26/6/17 [03-0179-1880-012]. Several variants of what appears to be the root Manchu term for ‘locust’ (*sebsehe*) appear in the 1761 operation documents. *Sebsehe* is glossed as *mazha* 蚂蚱, the north China regional term for locust, in several multi-lingual Qing dictionaries; *Gyosei Manju Mōko kanji sangō setsuin Shin bunkan*; *Gotai Shin bunkan yakukai*. The most common term used for locust in the 1761 documents (*sebsehe umiyaha*), however, does not appear, precisely, in any of the dictionaries I have consulted. Several modern dictionaries do list the term ‘*sebseheri umiyaha*,’ defining it as either a general term for the locust or grasshopper ‘species’ (*huangchong* 蝗蟲) or as simply ‘locust.’ *Umiyaha* is the general Manchu term for ‘insect’ (*chong* 蟲) and often used as a generic suffix, so it can be read in this context as a reference to the ‘locust insect.’ The Chinese term *chong* is not always translatable as ‘insect,’ but more like ‘creature.’ For a *chong locus classicus* that refers to ‘sages’ as the leading exemplar of the category of ‘naked *chong*,’ as distinct from the feathered furred, shelled and fish-scaled *chong*, see *Da dai liji buzhu* (2013), p. 251. ‘*Sebseheri*’ by itself appears as synonymous with *sebseheri umiyaha* in *Gyosei Manju Mōko kanji sangō setsuin Shin bunkan* and modern dictionaries, but I have not found an unambiguous example of this usage in the 1761 documents. Among them, MWLF QL 26/7/9 [03-179-1883-022] uses the widest range of *sebsehe* variants. Qing dictionaries suggest that some historical relationship exists between the Manchu *sebsehe* and the north China *mazha*, but I have found no confirmation of this in the 1761 documentary record, which, nevertheless, does seem to have added a new variant for ‘locust’ to the existing terminology. It also may imply some sort of trans-frontier concept of locusts common to regional Inner Asian and Han residents.

Shanxi officials “to eradicate locusts in the vicinity of the fields, sweeping them from south to north.”⁴⁹

Once this redeployment was complete, Ciriktai was working in conjunction with Han Green Standard troops stationed in Shanxi, as well as with the Datong 大同 and Shuoping 朔平 civil district magistrates. This multi-ethnic locust eradication force “arrived in the vicinity of the Han cultivated fields and conducted eradication operations day and night at full effort until they were all eradicated. Han fields were not in the slightest affected.”⁵⁰

While Ciriktai was riding hard to protect Han fields, one of his Plain Red Banner subordinates, Gaoliyang (n.d.), was defending the banner’s home territory against another wing of the swarm, employing a classic Inner Asian tactic that Ciriktai had probably been using before the arrival of the Han group from Ningyuan spoiled it. The locusts had flown straight for the Mongol pastures, but were slowed down by a light rain, “so that their wings got wet and they were entirely unable to fly.” When Gaoliyang’s horsemen had finally run them to ground they “dismounted and struck about, killing many. Human strength unassisted, however, could not prevail, so the troops mounted their horses and ranged themselves in battue formation and cantered forth to trample the locusts, killing many throughout the day.” By morning, their wings had dried, and Gaoliyang relentlessly pursued and attacked them until they flew beyond his jurisdiction to the northeast. The strenuous efforts of his unit had saved the Plain Red Banner’s agro-pastoral complex.⁵¹

These same efforts, however, probably herded the swarm into the fields and pastures of the Chakhar Plain Yellow Banner, which lay to the northeast of Plain Red Banner territory. Plain Yellow Banner Superintendent (Ma: *Gulu suwayan gūsa uheri da*) Nawang (n.d.) met this wing of the swarm in a spirit similar to Ciriktai’s. He reported that:

although the various swarms of locusts flying around do
no great harm to the grasslands of Mongolian pastures, if
they reach the fields of China proper, there will be serious

⁴⁹ MWLF, QL 26/7/3 [03-0179-1883-009]. The throne sent a court letter-style edict in Manchu to the governor of Shanxi province explicitly stating the locusts (*sebsehe*) were to be driven towards the north, “where there were no cultivated fields” and that it was “particularly incorrect” to drive them southwards. The governor was ordered to take charge of the Han Chinese side of the operations to ensure the locusts were driven in the proper direction; *Qianlong chao manwen jixin dang yibian*, 2:368-69/#152.

⁵⁰ MWLF, QL 26/7/8 [03-0179-1883-021].

⁵¹ MWLF, QL 26/7/9 [03-179-1883-022]. It is interesting to note that Gaoliyang’s formation surrounded locusts as they would have any other game animal, an action that appears as an ethnically distinctive response to a locust outbreak.

implications. It is also difficult to say where a particular swarm of locusts will fly to, so they should be completely eradicated and categorically cannot be allowed to turn towards the fields.⁵²

By this time, the swarms were being pursued by over 600 mounted Chakhar Mongol troopers on both sides of the Great Wall, aided by an indeterminate amount of Han soldiers and officials. It took more than a month for the swarms to be contained by this multi-ethnic force. Ciriktai declared the operation successfully concluded on August 30, 1761.⁵³

Conclusion

There is a considerable record of Han-Mongol relations of both conflict, which was strongly discouraged by the Qing state, and cooperation, which that same state seems reluctant, at best, to have promoted. This somewhat paradoxical attitude is demonstrated in exemplary detail by Manchu reports of Han agricultural ‘trespass’ into Mongol pastures. One 1753 report requires local officials to inspect Chakhar banner fields to determine whether there were Han cultivators who had rented these fields to reside there and farm them. The state made provisions for the punishment of both Han tenant trespassers and their Mongol co-conspirator landlords, including for the explicit offense of Mongol households’ ‘harboring’ (Ma: *halbume tebhengge*) Han.⁵⁴

These collusive Mongol-Han relations contrast with other eighteenth century accounts of environmentally disruptive Han incursions into Mongol pastures—sometimes abetted by Han officials from China proper—to perpetrate various forms of intensive resource extraction.⁵⁵ There could also be state-sanctioned cooperation between the two groups, as in 1749 when the state was favorably considering a Mongol proposal to

⁵² MWLF, QL 26/7/22 [03-179-1885-012].

⁵³ MWLF, QL 26/8/1 [03-179-1888-026].

⁵⁴ MWLF, QL 18/5/10 [03-0173-1097-004]. The 1749 statute being enforced in this memorial is recorded in *Qing huidian shili*, 10:1130b-31a.

⁵⁵ See, for example, the testimony of local Mongols questioned by Manchu officials in 1756 regarding the effects of alkali extraction from some salt lakes in Chakhar pastures: “One after the other they reported that ‘formerly when state-certified [Han] merchants boiled [lake water for] salt, forests were cut and burned to such an extent that mountains were deforested. Our grasslands were ruined and our horses and livestock were suddenly stolen. Because all were state-certified merchants, we feared to oppose them. Since no one has come to boil salt for the past several years, there have been no local incidents. Forests have gradually re-established themselves;’” QL 21/7/22 [03-0176-1603-022].

allow Han cultivators into some Chakhar fields. Would-be Mongol cultivators had found the fields too difficult to work. The Han farmers were to help reconvert fields useless for pasturing into agriculturally productive land.⁵⁶

Han-Mongol relations were, consequently, complex partly because both groups had interests that reflected social stratification—between elites and commoners, central state officials and local subjects, etc.—internal to each. Relations, however, were not exclusively determined by human social dynamics.

Locust swarms did not respect Qing administrative boundaries in their search for high concentrations of food. In fact, it is likely that both Han and Mongol cultivation (the latter was much less intensive) encouraged swarming behavior. Swarming was another manifestation of phenotypic plasticity, which in this case distinguishes locusts from their otherwise indistinguishable and much more agriculturally innocuous grasshopper relatives.⁵⁷ Their 1761 foray across the Shanxi-Inner Mongolian boundary had also inadvertently brought Han and Mongol together in a spontaneously cooperative effort that was mainly motivated by both groups' intimate relationships with cereal cultivars. In their voracious search for edible plants, *Locusta migratoria migratoria* had reinforced Qing multi-ethnic unity across a boundary deliberately maintained by its dynastic predecessors, the Ming in particular, to keep Han and Mongol militantly apart. Whether or not their cooperation was officially encouraged by Qing statute—and I have found no explicit evidence that it was—this common effort to stop locusts from entering China proper would still help to accustom both sides to an inter-ethnic, 'Qing' cooperation. Inter-ethnic cooperation could be both formalized and internalized simultaneously; indeed, that is in many respects an implicit Qing administrative ideal.

These 'Qing' locusts did not, by themselves, effect such a radical transformation in Han and Mongol identity. Qing imperial identities were products of many cultural factors, that have been comparatively well studied, along with a number of ecological factors, whose potentially constructive role remains almost entirely unexplored. Disastrous events like locust infestations nevertheless provided unexpected opportunities for intense trans-wall cooperation among groups often rhetorically and analytically separated by idioms of steppe and sown, herding and farming.

In fact, as demonstrated by the Manchu documents cited herein, it is difficult to entirely separate the cultural from the ecological once the appropriate environmental perspective is adopted. While a battue

⁵⁶ MWLF QL 14/4/13 [03-0172-0620-005].

⁵⁷ Simpson and Sword (2008), pp. 364-366.

formation may be considered a human orchestrated practice, for example, it cannot be practically implemented without the domestication of physiologically and socially amenable horses.⁵⁸ Such a formation made the swift game animals pursued by the hunters easier to surround than to ride after. Indeed, such prey agency was held to be a critical factor in the development of the military equestrianism that 'socially' distinguished elite Inner Asian formations from mass conscript infantry like the Han Green Standard soldiers. Several Manchu memorials request permission for troopers to hunt wild animals as the prerequisite for fostering and maintaining Manchu military superiority. In one instance, the memorialist explicitly stated that there were no wild animals to hunt in his China proper jurisdiction and that he be allowed to periodically take his troopers north of the Great Wall to hunt rabbits, foxes and gazelles in Chakhar steppelands.⁵⁹ These outstanding skills were not solely the product of human initiative, but the intersection of human predator action in competition with animal prey action that required an ecosystem space different from those prevailing in China proper. It has even been scientifically demonstrated that the brains of many domesticates have actually shrunk over time in comparison with their wild counterparts. In domesticated ungulates, for example, reduction ranges from 14% to 24%. There are indications that suggest brain reduction has occurred because humans "have become buffers between the animal and its environment."⁶⁰ By maintaining select animals as an integral part of elite military training, the dynasty was effectively recruiting steppe wildlife as 'Qing wildlife,' whose natural inclinations and endowments served the state as constructively elusive prey for its human recruits.

In the 1761 instance, however, locusts were not precisely prey, although "many" were trampled under the hooves of encircling Manchu mounts. Locusts had been the ones to initiate the conflict, not in pursuit of humans, but in pursuit of their grain plants. Indeed, had humans not been so dependent on these plants, tending to their very intricate needs over long periods of time, there would have been no need to confront the locusts and no opportunity to reinforce Qing multi-ethnic ties. Locusts were certainly not conscious of such ties, but it is hardly more likely that the humans involved were very aware of the fact that by fighting locusts together they

⁵⁸ See, for example, Anderson (2004), p. 33. Horses, nevertheless, were likely more difficult to domesticate than other farmyard animals like pigs and chickens; Zeder (2012), p. 250.

⁵⁹ MWLF, QL 14/4/9 [03-171-0311-001]; QL 29/10/16 [03-181-2113-006]. For a discussion of Inner Asian hunting as a military practice, see Allsen (2006), pp. 209-32.

⁶⁰ Zeder (2012), pp. 232, 234.

were strengthening a Qing imperial identity that was neither entirely pastoral nor agricultural but something of both.

The initial responses of both Ciriktai and Nawang expressing fear for Han fields is indicative of effective internalization of Qing imperial 'multi-environmental' values inculcated through prolonged interaction between cultures and ecologies that was not always orchestrated in any deliberate detail by the people involved. This process was the core of the Qing imperial project as it incorporated borderland environmental formations that I have explored in detail elsewhere as imperial pastoralism, imperial foraging and imperial indigenism, all in dynamic relations with a centering imperial arablism that defined environmental relations in China proper. All are suitably regional adaptations to "accommodate the spatial and temporal structure, intensity and unpredictability of environmental relations."⁶¹ This Qing 'environmentality' could even accommodate locusts, if not as subjects, then as occasions for enhanced human subjectivity through which a vast cultural and ecological diversity across imperial territory could be stably embodied. This was not always possible—and increasingly unsustainable as the nineteenth century wore on. Yet, if we consider the Qing locust as a marginal representative, we may discover a remarkable resilience not entirely maintained by humans that sustained the dynasty's tenure.

⁶¹ Bello (2016); Agrawal (1998), p. 23.

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