

The Fight against Heaven-Sent Insects:
Dealing with Locust Plagues in the Emirate of Bukhara

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Abstract

The late 19th and early 20th centuries were a time of crisis and change for Central Asian societies. Land reclamation, an agricultural shift to cash crops, trophy hunting and war led to the deterioration of a fragile ecosystem and encouraged outbreaks of agricultural pests. Among the most conspicuous were locust outbreaks which troubled the Bukharan Emirate during this period. Large swarms destroyed most of the crop, making the population dependent on grain imports. Locusts were a well-known pest although traditional land use practices seem to have constrained long-term outbreaks. Dealings with the insects, once they appeared were modest, though. The establishment of Russian colonial rule in the region deeply interfered with existing conceptions of human-environment relations and increased the pressure on resources. Locust combat was a controversial subject between colonial and Bukharan officials as well as their subjects: Like other kinds of natural disasters which were beyond human control, locusts were perceived as a heaven-sent visitation in Bukhara – turning a combat into an anti-divine activity. The fight against locusts reached a political dimension around 1900 when the Russian colonial administration tried to pressurise the Bukharans into using modern insecticide and blamed their superstition for the resistance they met. This article will examine the reciprocal effects of changes in land management and pest outbreaks, and the controversies of locust combat between traditional responses, colonial demands and religious conceptualisations.

Keywords

Locusts, human-environment relations, environmental imaginaries, colonial recast of agriculture, cosmology

Some say, the locust appeared on the earth from the sneezing of a big sea fish. During the sneezing of these monsters, the locust jumped out of [its] nostrils in masses; others, for example “Khakimi-Tarmizi” [sic]¹, relate that the locust was created by God from the remains of that clay from which the first man Adam had been created. According to the venerable Umar (one of the “char-yar” [four friends] of the Prophet Mahomed), it is said that God had created up to one thousand different kinds of creatures. Of these six hundred lived in the water and four hundred on land, among them the locust.²

The late nineteenth and early twentieth centuries were a period of crisis and change for Central Asian societies. The establishment of Russian colonial rule in the region, internal strife, mismanagement, and increasing pressure on resources all added to a climate of uncertainty, vulnerability, and rural exodus in order to evade taxes and other duties.³ Virgin land reclamation, land abandonment, agricultural conversion to cash crops, trophy hunting and war led to the deterioration of a fragile ecosystem and encouraged outbreaks of agricultural pests, most notably locusts. Travel ac-

¹ Al-Hākim al-Tirmidhī, an eminent ninth century Sufi, jurist and traditionalist, see Yves Marquet, ‘Al-Tirmidhī’, in *Encyclopaedia of Islam (Second Edition)*, vol. X, pp. 544-546 (Leiden: Brill, 2000).

² *Turkestanskije Vedomosti*, 24 March 1902, 141.

³ Jeanine Dağyeli, “‘Weapon of the discontented?’ Trans-river Migration as Tax Avoidance Practice and Lever in Eastern Bukhara’, *Transcultural Studies* 1 (2017): 169-196.

counts, newspapers and other contemporary sources talk about an accumulation of large-scale locust plagues during this period. The swarms sometimes infested regions for years and destroyed most of the crop, making the population dependent on grain imports from other provinces. The fight against locusts reached a political dimension around 1900 when the Russian colonial administration tried to pressurise the Bukharan vassal state into using modern insecticide and blamed the alleged superstition of the population for the resistance they met. The colonial power divide together with the encounter of a modernist ontological paradigm and holistic, local taxonomies resulted in contrasting views as to how to deal with the insects. Locusts were allotted a cosmological role in Central Asian thinking, and explanatory models which included the supernatural invited different problem solving strategies than purely technological ones.⁴ Naturally, in day-to-day life these positions presented themselves more as a continuum than as two antagonistic blocks.

Locusts (*malakh* in Persian, *chikirdka* in Uzbek/Chaghatay) were an established part of Eurasian ecosystems; Bei-Bienko and Mishchenko speak of 59 different species inhabiting Central Asia and Transcaucasia.⁵ Under normal conditions they were mostly unobtrusive. When their feeding and travelling habits interfered with human interest in agricultural crops planted on the irrigated lowland plains and the secondary mountain rangelands, conflict arose. Locust swarming was no rare phenomenon for the rural population of late nineteenth and early twentieth century Bukhara. I argue, however, that the numerous reports of locusts during this period are not only a result of comparably more and better agricultural surveys and more surviving primary sources but reflect real increases in locust populations as well, advantaged by thorough changes in the ecosystems. Contingent upon a series of entangled environmental and human activities during the turn of the century, mass invasions of locusts furthered an agricultural crisis already in the making. Locust outbreaks were usually not directly responsible for food shortages and famines but their occurrence aggravated natural hazards like drought, and social or administrative failures like ill-designed or absent relief actions. The insects not only caused failure in agricultural crops like grains, legumes, forage plants and cash crops. They also damaged pastures. Extensive locust attacks that completely strip plots of their vegetation may moreover lead to surface erosion. This consequently also affects wild animals, besides farmers, pastoralists and livestock.

By looking through locusts at the human-environment interface in the Emirate of Bukhara, this article investigates into local environmental and cosmological imaginaries, sense-making of disasters, and the birth of a utilitarian discourse⁶ in Central Asia driven by modernist colonial ideas which increasingly sorted locusts out of the fauna as “pest” (*vreditel'*) and “enemy” (*vrag*). It examines the reciprocal and often detrimental effects of changes in land management and locust outbreaks, and the controversies around locust combat kindled by conflicting approaches towards this part of the environment. The locust-crisis nexus so prominent in colonial Russian sources appears as an

⁴ See Andre Gingrich and Elke Mader, ‘Der Elefant im Garten’ in A. Gingrich and E. Mader (eds.), *Metamorphosen der Natur. Sozialanthropologische Untersuchungen zum Verhältnis von Weltbild und natürlicher Umwelt*, pp. 7-30 (Wien et al.: Böhlau, 1993).

⁵ G.Īa. Bei-Bienko and L.A. Mischenko, *Saranchevye fauny SSSR* (Moscow and Leningrad: Izd. AN SSSR), p. 69.

⁶ James Scott, *Seeing like a State. How Certain Schemes to Improve the Human Condition have Failed* (New Haven and London: Yale University Press, 1998), p. 13.

arena for a tug of war between local practice, colonial demands and religious conceptualisations of an animal that was subject to an anthropocentric approach by both local populations and colonialists but with very different objectives. Following the locust trail and thinking agricultural crisis through the insects leads to a consideration of war destruction as well as agricultural and environmental turnover to add to the political history of colonial, modernist hegemonic aspirations vis-a-vis a so-called backward, superstitious Central Asian Other.

The agricultural recast of Bukhara

In late nineteenth and early twentieth century Bukhara, we see a conjuncture of factors promoting the growth of locust populations. The turn from the nineteenth to the twentieth century witnessed a huge turnover in Central Asian agriculture. The natural environment was subjected to a large-scale anthropogenic makeover following the colonial revaluation of landscapes and crops. Although the Emirate of Bukhara as a vassal state was more indirectly affected than Russian Turkestan which stood under direct colonial rule, changes were marked. In an effort to develop new agricultural lands, reed beds along the rivers as well as riparian forests (*tugai*) or other tree populations were cleared or burned down and converted into cropland, especially for the cash crop cotton. This had serious effects on locust predators and simultaneously opened up new breeding habitats for grasshoppers. A number of larger animals, among them tigers feeding on locusts as will be discussed later, inhabited the already fragmented wildlife corridors. They were increasingly subjected to intensive hunting by parties of sportsmen and military personnel.⁷ The Russian army was explicitly employed to clear predators like the Caspian Tiger (*Panthera tigris virgata*), wolves and leopards from their habitats; up to World War I, it killed approximately one hundred tigers per year, half of them on Eastern Bukharan territory in the forests of the Panj and Amu Darya.⁸ The combined effects of habitat loss and hunt on their prey species (especially wild boar and deer) and themselves ultimately led to the extinction of the Caspian tiger. On a different plain, the cash-crop oriented environmental makeover unintentionally advantaged the locusts. Some locusts species thrive in drained swamps, fallow fields and other undisturbed soil while they avoid intensively cultivated areas for breeding. For now, there is no study on the impact of the gradual extinction of tigers, swamp drainage and land reclamation on locust populations.

The environmental history and imaginary have received little attention in the study of Central Asia.⁹ The recast of the landscape seems to have gone without apprehensible local responses. If there was

⁷ V.G. Heptner and A.A. Sludskij, *Die Säugetiere der Sowjetunion. Vol. 3: Raubtiere (Feloidea)* (Jena: VEB Gustav Fischer Verlag, 1980), pp. 100-102, 162, 166. On the territory of the Bukharan Emirate, the main tiger habitats into the twentieth century included the Panj and Amu river valleys, the Chubek and lower Kyzylsu, the Vakhsh and the Yakhsu rivers, the upper reaches of the Kofarnihon and Surkhandarya rivers down to Termez and the Hissar Valley with the lower Vakhsh River (*ibid.*, 101-102, Hartmut Jungius et al., *Pre-feasibility study on the possible restoration of the Caspian Tiger in the Amu Darya Delta* (2009), https://www.researchgate.net/publication/265071289_Pre-Feasibility_Study_on_the_Possible_Restoration_of_the_Caspian_Tiger_in_the_Amu_Darya_Delta_by (retrieved 12.12.2017), 5). Possibly, tigers may have populated the riparian parts of the Zarafshan Valley but reports are only vague (Heptner and Sludskij, *Die Säugetiere der Sowjetunion*, p. 103).

⁸ Vitalii G. Prokhorov, *Zhivaia Kontrabanda* (2002), <http://www.yurclub.ru/docs/ecology/article13.html> (retrieved 18.01.2016).

⁹ Neighbouring regions are better researched. See for example Willard Sunderland, *Taming the Wild Field. Colonization and Empire on the Russian Steppe* (Ithaca: Cornell University Press, 2004), and David Moon, *The Plough that Broke*

dissent, it did not reach us, possibly muted by fear of repression during the emirate and colonial period, as well as by the undisputed primacy of modernist and technocratic approaches to the environment during the following first Soviet decades.¹⁰ Besides the new dimension of anthropogenic interference in landscapes, habitats and animal populations, war had a major impact on the social, ecological and physical environment. The eastern parts of the Emirate of Bukhara were devastated in a row of campaigns lasting from 1866 to 1869 by which the emir Muzaffar sought to bring independence-minded dominions back under his control. Although there are no exact numbers for the war-induced damage, Russian officials visiting the region some decades later speak on the basis of eye witness accounts of half of the population murdered, one quarter exiled, infrastructure destroyed to a substantial extent and fields abandoned.¹¹ In the town of Denau alone 1,000 prisoners of war were executed after the fall of the citadel in front of the emir who threatened the executioner with the same fate if he did not finish his duty by sunset.¹² A similar account was given for the small mountain town of Karatag where the heads of the decapitated were said to have been piled up at the fortress walls attracting birds of prey. The dam which secured the town's water supply was also destroyed.¹³ Echoes of war atrocities even seeped into the collective memory of the far-off capital Bukhara where the emir was rumoured to have decapitated four hundred prisoners of war per hour and piled their heads to a tower.¹⁴ Vast stretches of land that had fallen into disuse during war-time remained in this state for want of population and means to bring them back into cultivation. Large sums of money, the so-called *pūl-i amān*, had been extracted from the population in return for mercy upon the surrender of Kulob¹⁵ which left the subjected provinces financially drained. Upon reports from the local population of Fayzabad, grain cultivation had seen a dramatic decrease since the Bukharans (i.e. the emir and his administration) took control over the country.¹⁶ Apparently this was at least partly due to a lack of working animals. While in pre-conquest times the whole Ilak valley¹⁷ had been cultivated, there were now but three hundred *qosh* (pair of trek ox) to till the land. Using this unit of measurement, the general staff member, captain Liliental' calculated that

the Steppe. Agriculture and Environment on Russia's Grasslands, 1700-1914 (Oxford: Oxford University Press, 2014 [2013]) for the Russian steppe, Diana K. Davis and Edmund Burke III (eds.), *Environmental Imaginaries of the Middle East and North Africa* (Athens, Ohio: Ohio University Press, 2011), Alan Mikhail (ed.), *Water on Sand. Environmental Histories of the Middle East and North Africa* (New York: Oxford University Press, 2013) and idem, *Under Osman's Tree. The Ottoman Empire, Egypt and Environmental History* (Chicago and London: University of Chicago Press, 2017) for the Ottoman Empire and the Middle East.

¹⁰ This stands in remarkable contrast to a nineteenth century environmental discourse in Russia proper which was centred on feelings of loss of former landscapes, see Moon *The Plough that Broke the Steppe*, pp. 89-93, 294-300.

¹¹ M.A. Varygin, 'Opyt opisaniia Kul'abskago bekstva. Kratkiĭ istoricheskiĭ ocherk', in D.I. Mushketov (ed.), *Izvestiia Imperatorskago Russkago Geograficheskago Obshchestva. Tom LII. 1916 g., Vypusk X.* (Petrograd: Tipografiia M.M. Stasiulevicha, 1916), pp. 737-803, p. 741.

¹² Sadridin Ayni, *Ta'rikhi amironi Manghitiya* (Dushanbe : Nashriyoti Davlatii Tojikiston, 1966), pp. 42-43.

¹³ Gabriel Bonvalot, *Through the Heart of Asia. Over the Pamir to India. Vol. I* (London: Chapman and Hall, Ltd, New York: A.C. Armstrong and son, 1889), pp. 219-220. From names and circumstances in the account, it seems very likely that this incident refers to the same war but the dating would then be incorrect. Bonvalot's anonymous native informant set the mass execution to which his father also fell victim at thirty years before Bonvalot's journey which would then have been around 1858 instead of 1868. The number of 1,000 is likely to be a trope for "many", not an exact number of victims.

¹⁴ Sadridin Ayni, *Margi Sudkhur* (Dushanbe : Adib, 2010), p. 29. The local narratives quoted in this novel may or may not be historically correct. They mirror, however, the extend of bloodshed as reflected by contemporaries.

¹⁵ Mirza 'Abdal'azim Sami, *Ta'rikh-i salatin-i Manghitiya*, ed. L.M. Epifanova (Moscow: Izd. Vostochnoi Lit., 1962), p. 110.

¹⁶ Fayzobod is today a district town in the Districts of Republican Subordination, Tajikistan.

¹⁷ The reach of the Vakhsh River in the Fayzobod district.

but 1/25 of the agriculturally exploitable land in Fayzabad was still farmed. Locals also told him that during the last three years locusts had eaten up the harvest,¹⁸ possibly a post-conquest result of field abandonment. A similar assessment was made by M.A. Varygin who stated on the basis of local information that approximately 2,750 hectares of excellent soil suitable for rice or wheat cultivation in the Kulob province lay fallow since the Bukharan conquest.¹⁹ Fallow, formerly cultivated fields were, however, another favourite breeding ground for locusts. War-induced field abandonment, reclamation of virgin lands, clearing of forests and the extinction of predators all provided favourable conditions to locust populations. As adumbrated above, their habit of preferring open environments undisturbed by agriculture for oviposition in that sense turned the locusts into war profiteers.

The geographic extent of locust outbreaks was usually poorly recorded. Some areas seem to have been locust ridden for most of the last decades of the nineteenth and the first decade of the twentieth centuries. Already in 1881 the colonial chief administrator of the Zarafshan district (*okrug*) had reported to the general governor of Russian Turkestan, then Konstantin von Kaufmann, that the southeastern Bukharan provinces Kulob, Baljuvon, Qurghon-Teppa had suffered from locusts for years.²⁰ Usually a combination of droughts, harsh winters and locusts that had allegedly come in over the Amu Darya from Afghanistan was held responsible for difficult conditions in rural areas of Eastern Bukhara.²¹ On April 10, 1885, the colonial chief administrator of the Zarafshan district again reported that a major locust outbreak on Bukharan territory was imminent and blamed this on the absence of any measurements from the Bukharan government to destroy them.²² Liliental' reported in 1889 from the Hisor province that locusts had devoured the entire harvest for three successive years; in the fourth year they appeared again but belatedly, allowing the peasants to secure most of their grain before the insects swept over the fields. Peasants considered themselves lucky and the wheat harvest sufficient, enough to prevent the hunger of previous years.²³ Around 1898, another multi-year locust plague hit the provinces Hisor and Kulob. In 1901 peasants in the Vakhsh Valley suffered from locusts but the year 1902 turned out to be even worse.²⁴ When the botanist Roman Rozhevits visited the provincial town of Kulob in 1906, he found the vegetal cover of surrounding meadows eaten up by locusts. A fellow traveller, apparently a native who spoke Russian explained that the town had already suffered from locusts for eight consecutive years. Visiting the province of Qurghan-Teppa in April that year, he found north of the village of Laghmon in a large meadow abundant with *Malcolmia* and poppies "such a mass of young locusts that they literally

¹⁸ [Genrikh G.] Liliental', 'Marshruty po Gissarskomu i Kabadianskomu bekstvam', in *Sbornik geograficheskikh, topograficheskikh i statisticheskikh materialov po Azii 57* (Saint Petersburg: Voennaia Tipografiia, 1894), p. 347-348.

¹⁹ Varygin, 'Opyt opisaniia Kuliabskago bekstva', p. 781.

²⁰ *Ibid.*, p. 98.

²¹ Uvarov already criticised in 1928 that sudden mass appearances of locusts are conveniently ascribed to them originating somewhere else without ever addressing the question of what caused their swarming in that region, B.P. Uvarov, *Locusts and Grasshoppers. A Handbook for their Study and Control* (London: The Imperial Bureau of Entomology, 1928), p. 145. There may, however be some truth in the image of locust as outside intruders since a seasonal, dust carrying hot wind (*huri, khoqbodi afghon, Afg'on shamoli*) from the south, i.e. Afghanistan may have played a part in bringing them in.

²² Yusupov, *Ocherki istorii Kuliabskago bekstva*, p. 98.

²³ [Genrikh G.] Liliental', 'Gissarskoe i Kabadianskoe bekstva', in *Sbornik geograficheskikh, topograficheskikh i statisticheskikh materialov po Azii 57* (Saint Petersburg: Voennaia Tipografiia, 1894), p. 317-318.

²⁴ Sharqi Yusupov, *Vakhshskaia dolina nakanune ustanovleniia sovetsoi vlasti* (Dushanbe: Donish, 1975), p. 43.

covered the road and of sumptuous plants there remained not rarely only the hardest, thickest part of the stalk.”²⁵ Rozhevits criticised local anti-locust measurements which he found totally insufficient. They consisted in digging a large trench (*ariq*) close to the domicile of nymphs, throwing them inside and burying them. Since even this measure was not applied consistently and everywhere, the results remained modest.²⁶ The Russian official Varygin who visited the region wrote in 1916 that the towns of Saray and Termez had already been locusts-ridden for two years and continued:

“During the last years, locusts have appeared in the bekdom [of Kulob] and have eaten all the wheat, they only spared flax; there was nothing to stop them in the plains, except for the rice that grows in paddies and is exported to the province Baljuvan no crop was spared. ... Because of the passive attitude of the population as well as of the government vis-a-vis the locusts, almost all of Bukhara is locust-ridden and there are provinces which have not seen their own grain for dozens of years; these are for instance the Hisar Valley and the province of Kuliab.”²⁷

To make things worse, Central Asia experienced unfavourable weather conditions during the late 19th and early 20th centuries, possibly a result of the end of the Little Ice Age.²⁸ The 1880s were dry above the average.²⁹ Several unusually hard winters had decimated animal stocks. The years 1889 and 1893 were again very dry, and drought in combination with an over-cultivation of cotton, speculation on grain and poor infrastructure led to famine in some Central Asian areas in 1893. Under the headline Famine in Central Asia, the newspaper *Boston Evening Transcript* reported with regard to Russian Turkestan: “Despatches bring details on the famine in Central Asia. ... Besides the overgrowth of cotton, the ravages of the locusts and the excessive dryness of the summer combined are the cause. In the Volga district it is exactly the reverse, but the government is forcing the peasantry to pay in money the loans for food and corn given in the famine years [the 1891-92 famine in southern Russia], and at the then existing rate. ... Yet this district is in direct river, sea and rail communication with Samarkand. As a matter of fact the distress in Turkestan is caused by a syndicate of grain merchants, who have raised prices artificially.”³⁰ The *New York Times* of the same day added that army contractors declined to support the troops who had turned on the population for provision.³¹ One day later, the Los Angeles paper *The Herald* equally blamed a “grain trust gotten up by a syndicate of merchants”³² and the *North Otago Times* of March 29, 1894 criticised that people in Samarkand were starving and demanded the Russian government to intervene: “It

²⁵ R.Īu. Rozhevits, ‘Poezdka v ĪuzhnuĪu i SrednuĪu Bukharu v 1906 g.’, in *IzvestĪia imperatorskago Russkago geografĪcheskago obshchestva*, vol. 44 (9) (St. Petersburg: Tip. M.M. Stasiulevicha), pp. 593-651. , p. 615.

²⁶ *Ibid.*, pp. 619-620.

²⁷ Varygin, ‘Opyt opisaniĪa Kuliabskago bekstva’, p. 795.

²⁸ For Central Asia, the end of the Little Ice Age is usually set between the 1860s and 1900, see Chen Fahu, Huang Xiaozhong, Zhang Jiawu, J.A. Holmes and Chen Jianhui, ‘Humid Little Ice Age in arid central Asia documented by Boston Lake, Xinjiang, China’, *Science in China Series D: Earth Sciences* 49/12 (2006): 1280 and Jiangnu Lan, Hai Xu, Enguo Sheng, Keke Yu, Huixian Wu, Kangen Zhou, Dongna Yan, Yuanda Ye and Tianli Wang, ‘Climate changes reconstructed from a glacial lake in High Central Asia over the past two millenia’, *Quaternary International* 487 (2018): 43-53.

²⁹ Sharqi Yusupov, *Ocherki istorii Kuliabskago bekstva v konce XIX i nachale XX veka* (Dushanbe: AN Tadjh. SSR, 1964), p. 98.

³⁰ *Boston Evening Transcript*, 23 Dec. 1893, 10.

³¹ *New York Times*, 23 Dec. 1893.

³² *The Herald. Los Angeles Sunday Morning*, 24 Dec. 1893, 1.

seems to be high time the government should step in and create an equilibrium between the plethora of grain and want of buyers on the Volga and the absurd prices asked and given in Turkestan.”³³

Bukhara escaped the direst consequences because it never had the extensive, one-crop specialised agriculture with so much land under cotton as the Ferghana Valley in Russian Turkestan did; it even fell short of the Khanate of Khiva. After considerable increases in cotton farming there were still only around five percent of Bukharan lands under cotton as compared to over fifty percent of wheat for domestic use.³⁴ The German, Baku-based oil industrialist Max Albrecht who visited Bukhara in autumn 1893 nevertheless saw cotton as the culprit for grain shortages in the emirate: “Goaded by the Russian wholesale buyers of the cotton mills in Moscow and Lodz, there are currently so many estates planted with cotton that a dearth of grain occurred in the year 1893 and the emir was forced to buy grain in Russia to prevent a famine.”³⁵ The Crimean Tatar newspaper *Tarjumān* likewise reported on November 19, 1893 that the Bukharan emir had sent emissaries to Azerbaijan to buy food.³⁶ Alerted by the supply shortfalls, the Bukharan ruler compelled his subjects to grow a certain amount of wheat on their fields as a provision.³⁷

Locusts taxonomies

What comes to mind when thinking about locusts is their proverbial appetite. Locusts can consume approximately their own weight in plant parts daily. In biological classification, locusts and herbivorous grasshoppers belong to the Acrididae family of short-horned grasshoppers. Many grasshopper species live solitary lives without causing too much harm to cultivated areas.³⁸ Under certain circumstances, some species may, however, develop into gregarious forms³⁹, gather in large swarms and travel considerable distances whenever food is exhausted. Their habitat, often marginal and parched grassland is called “outbreak area” because these environments provide conditions for locust outbreaks if food becomes scarce because of flooding or drought. The scarcity forces the solitaries to crowd on small spots with remaining food.⁴⁰ The environmental stimulus causes dramatic changes in the insects. By hormonal adjustment, predominantly the release of serotonin they respond to the crowdedness and develop into their gregarious form: their wing length to talus ratio changes, some species alter colours, they breed abundantly with new generations reaching adulthood much earlier than their solitary forms and gather in large migratory bands. Swarms can extend to several hundred square kilometres with some 40 to 80 million locusts per square kilometre.⁴¹ Locust outbreaks may last several years in an area until the population collapses due to a lack of food

³³ *North Otago Times*, 29 March 1894, 4.

³⁴ Seymour Becker, *Russia's Protectorates in Central Asia: Bukhara and Khiva, 1865-1924* (London and New York: Routledge Curzon, 2004), p. 144.

³⁵ Max Albrecht, *Russisch Centralasien. Reisebilder aus Transkaspien, Buchara und Turkestan* (Hamburg: Verlagsanstalt & Druckerei A.-G., 1896), p. 165.

³⁶ *Tarjumān*, 19 Nov. 1893, 2. See Zaynabidin Abdirashidov, *Annotirovannaia bibliografiia Turkestanskikh materialov v gazete "Tarjumān" (1883-1917)* (Tokyo: TIAS, 2011).

³⁷ Annette Meakin, *In Russian Turkestan. A Garden of Asia and its People* (London: George Allen, 1903), p. 33.

³⁸ For Central Asia these are for example the *Hyalorrhypis*, *Bufonacridella* and *Diexis* which are endemic to deserts with shifting sand hills (Uvarov, *Locusts and Grasshoppers*, p. 90).

³⁹ Gregarious behaviour in grasshoppers means they gather in huge numbers and eventually swarm.

⁴⁰ Helmut F. van Emden, *Handbook of Agricultural Entomology* (Reading: Wiley-Blackwell, 2013), p. 48.

⁴¹ *Ibid.*, p. 49.

whereupon only the solitaries in the outbreak areas remain.⁴² In many areas of the world, spectacular locust outbreaks, although a real agricultural threat, are relatively rare and random whereas the annual recurrence of non-gregarious grasshoppers may be a serious concern.⁴³ It seems, however, that the solitary grasshoppers were not of too much concern to peasants and stock breeders in Central Asia possibly because of the relative abundance of scarcely populated or unsettled land which prevented direct conflict between human economic interests and grasshoppers. Only if food in their xeric, marginal areas finishes, solitaries also invade fields and orchards. The Atbasar grasshopper for example hatches in early spring and feeds in the steppe and ephemeral semi-steppes until the food finishes whereupon it moves on into agricultural areas.

Strictly speaking, only those grasshoppers that may become gregarious and form large swarms are locusts.⁴⁴ Most notably among the peregrine locusts in southern Central Asia were the Migratory locust (*Locusta migratoria migratoria*), the Moroccan locust (*Dociostaurus maroccanus*) and the Desert locust (*Schistocerca gregaria*). Migratory locusts either bred on Bukharan territory or were carried in by the wind from Khiva, Afghanistan, Russian Turkestan, Iran, Russia and other places. Among the stationary locusts the Italian locust (*Calliptamus italicus* – despite its name a native of Central Asia), *Paracyptera microptera turanica* and the Atbasar grasshopper (*Dociostaurus kraussi*) prevailed, the latter a non-gregarious species. All these species were neither distinguished semantically in Central Asian languages nor in Russian reports of the time. A very striking classification was promoted by the entomologist Ernst Wilhelm Schleich who argued that locusts held an intermediary position between plants and animals since they were accepted as food by herbivores and carnivores alike.⁴⁵

The life cycle of grasshoppers lasts between eight months and two years. Female locusts lay their eggs in pods into the soil. The pods of each locust species have their own characteristics.⁴⁶ The newly hatched nymphs or hoppers are unable to fly and moult several times according to species until they reach their adult size. Depending on weather and species, the nymphs appear between mid-April and June, wing inflation varies according to weather, geological zone and species between April and June, and the adult insects appear by early July.⁴⁷ Oviposition takes place from early July onwards. Some species like the Atbasar grasshopper die after egg deposition, others hibernate. *Acrotylus insubricus*, a bandwing grasshopper living in xeric grassland and weedy fields in Turkestan buries itself every evening as soon as the temperature drops beneath 10° C in autumn.

⁴² Ibid., pp. 48-49.

⁴³ Ibid., p. 49.

⁴⁴ Ibid., p. 48.

⁴⁵ Ernst Wilhelm Schleich, *Die geographische Verbreitung der Wanderheuschrecken in ihrer Abhängigkeit von physikalischen Faktoren* (Würzburg: Mayr, 1935), p. 35.

⁴⁶ V.I. Plotnikov, *Nasekomyia*, 198. The differences refer to pod shape, number of pods and eggs, hatching time etc. The Moroccan locust lays one to three pod which contain 12 to 30 eggs, those of the Italian locust 25 to 55, of the Atbasar grasshopper 5 to 21, the 4 to 5 pods of the Desert locust up to 100. The Desert locust moreover has several generations a year whereas the Migratory locust has only one (van Emden, *Handbook*, 49).

⁴⁷ Plotnikov, *Nasekomyia, vrediashchiia sadovodstvu, polevodstvu i ogorodnichestvu v Turkestane c ukazaniem sposobov borby* (Tashkent: Tipo-litografiia V.I. Il'ina, 1914), pp. 200, 208.

Towards the end of the season it permanently remained beneath the earth only to reappear in spring.⁴⁸

Breeding conditions for locust species vary. The Migratory and the Desert locusts need soil moisture to develop from egg to nymph. Their preferred breeding habitat are woodless riparian and alluvial zones, reed-beds, and temporary water-bearing depressions of torrential streams and river deltas. The Italian locust, Moroccan locust and Atbasar grasshopper breed in dry, undisturbed soils in steppes or pastures. One of their preferred hatching places were abandoned fields for they provided a poriferous yet undisturbed soil. They also became native in formerly swampy areas that had been drained. Schleich pointed out the middle course of the Amu River as a shared habitat for both Migratory and Moroccan locust.⁴⁹ Moroccan locusts also shared their habitat with the Atbasar grasshopper. Locusts are exposed to a number of risks in the course of their growth stages.⁵⁰ In years with excessive spring rainfalls, the eggs of the Moroccan locust suffer from a high natural mortality rate caused by fungal pathogens. Entomopathogenic fungi like *Beauveria bassiana* or *Metarhizium anisopliae* cause various types of muscardine in nymphs and adults. The *Entomophthora grylli* fungus is a pathogen that infects locusts in different stages of their evolution.⁵¹ Uvarov warns, however, of high-flying hopes during his time to use the fungus as a biological anti-locust agent.⁵² He especially points out that some locust species like the Migratory locust are never infected by *Entomophthora grylli*⁵³ and that the fungus needs damp and warm weather to be infectious.

Instars and imagoes fall prey to a number of natural predators. Rosy starlings (*pastor roseus*, taj. *soj*, uzb. *soch*) played a special role here. These are migratory, omnivorous birds that prefer insects, especially locusts and grasshoppers of which they can eat up to 180 individuals a day. They form large flocks and even follow their prey. The geographer Fritz Machatschek witnessed large swarms during his travels in 1911 and 1914, and mentioned their important contribution to locust combat.⁵⁴ Schleich noted that rosy starlings kill more locusts than they are able to consume provided they find water somewhere close by if their beak becomes sticky.⁵⁵ In Central Asia they are summer visitors who may in their turn become a pest in fields and orchards for they also finish grain fields, mulberry fruit on the trees and other fruit plantations.⁵⁶ The introduction and increasing promotion of pesticide for locust control by the Russian administration decimated the number of locust predators who fed on the polluted insects. Their dietary preferences made rosy starlings even more vulnerable to toxicity from pesticides than other birds. Apart from other obvious predators like insects, reptiles,

⁴⁸ Uvarov, *Locusts and Grasshoppers*, p. 63.

⁴⁹ Schleich, *Die geographische Verbreitung*, p. 66.

⁵⁰ See Uvarov, *Locusts and Grasshoppers*, pp. 103-143, Schleich, *Die geographische Verbreitung*, pp. 31-36.

⁵¹ Uvarov, *Locusts and Grasshoppers*, pp. 136-140, Schleich, *Die geographische Verbreitung*, p. 32.

⁵² Uvarov, *Locusts and Grasshoppers*, pp. 136, 138.

⁵³ The Italian locust is infected, however (see Uvarov, *Locusts and Grasshoppers*, p. 136, fig. 64).

⁵⁴ Fritz Machatschek, *Landeskunde von Russisch Turkestan* (Stuttgart: Verlag von J. Engelhorn's Nachf., 1921), p. 106.

⁵⁵ Schleich, *Die geographische Verbreitung*, p. 32.

⁵⁶ V.A. Moiseev and D.İu. Kashkarov, *Zhivotnyĭ mir Uzbekistana. O'zbekistonning hayvonot dunyosi* (Tashkent: O'qituvchi, 1990), pp. 112-113. After decades of pesticides use, rosy starlings have been promoted with scientific approval on Xinjiang farms as a natural pest control since the 1980s (Pamela Rasmussen and John C. Anderton, *Birds of South Asia. The Ripley Guide* (Washington DC: NMNH Lynx Editions), pp. 582-583).

amphibians and birds,⁵⁷ the now extinct Caspian tiger also seem to have played a part in the local food chain. The big cats apparently fed on the protein-rich insects, sometimes additional to other prey, sometimes exclusively as the stomach content of killed specimens showed.⁵⁸ Finally, weather itself could cause the collapse of an outbreak. When Central Asia was on the verge of a massive invasion by Moroccan locusts in 1917, the young hoppers died within a few days because of severe drought and lack of food.⁵⁹

The weather and concurrently the timing of hatching were of crucial importance to farmers. Depending on locality and micro-climate, autumn seeds, most importantly wheat were ready for harvest from May onwards. If locusts appeared before, the grain harvest was ruined. As a rule, the soil in Central Asia was ploughed up after harvest for a second crop. If locusts appeared in June, they would eat away the fresh plants, mostly vegetables, together with fruit and cotton. Since they also devoured mulberry leaves which would have been used to feed silkworms, they could destroy a year's silk harvest, too. If they were especially aggressive, they ate up the leaves thoroughly down to the bare saplings stopping the tree from coming into leaf again and causing another year without silkworm rearing.⁶⁰ Locusts could also weigh down bushes and more fragile plants by their sheer weight. Migratory locust swarms besides give hints about weather and microclimatic circumstances. For the reconstruction of past weather, locust population dynamics can act as climatological and hydrological indicators: large outbreaks of the Migratory locust are especially likely after several unusually dry years in a row because the exposure of formerly underwater or seasonally flooded soils in wetlands expands the breeding habitat of the insect. For other reasons, drought years also benefit the Moroccan locust. Firstly, its eggs are better protected from fungal pathogens. Secondly, more of its favourite breeding habitats become available as fields are more likely to remain fallow due to a lack of irrigation water, and pastures are prone to overgrazing.

Naming animals in different languages and cultural settings tells much about the ways they are conceived of. Paraphrasing Deleuze and Guattari, Tim Ingold distinguishes three modes of conceiving of an animal by naming: an anthropomorphising, objectifying or an activity-centred description.⁶¹ In local Central Asian ontologies locusts first belong to an order of living beings (*jonvar*, *jondor*, *hayvon*) – literally “having a life/ a soul” or “being alive” – which had both a physical existence and a symbolic, higher meaning. Together with other insects and arachnids, locusts form a collective called *hasharot*. This word, stemming from the Arabic root *h-sh-r* which as a verb means to congregate, mass, crowd or flock together already indicates an implicit understanding of these animals: they were characteristically seen as a collective of massive scale. As to their swarming, they were however distinguished from other insects that make a collective appearance. While the swarming of bees is called *ghimirlamoq* in Uzbek, possibly an onomatopoeic verb alluding to their habit of hov-

⁵⁷ See Schleich, *Die geographische Verbreitung*, pp. 31-36.

⁵⁸ Heptner and Sludskij, *Die Säugetiere der Sowjetunion*, p. 140, see also Schleich, *Die geographische Verbreitung*, p. 35. Uvarov, who naturally was not aware of later research results was rather cautious. To him, the role of large predators was mainly regulatory, helping to maintain a balance (*Locusts and Grasshoppers*, p. 146).

⁵⁹ Uvarov, *Locusts and Grasshoppers*, p. 146.

⁶⁰ Plotnikov, *Nasekomyia*, p. 196.

⁶¹ Tim Ingold, *Being Alive. Essays on Movement, Knowledge and Description* (London and New York: Routledge), p. 174.

ering “orderless” in the air before making quick movements, that of locusts is called *yopirilmoq* which means “to gather, to form a swarm” but also “to descend on, to attack” and “to scatter [in a certain place]”.⁶² This second verb is not used exclusively for locusts but also for flocks of birds raiding fields and orchards. Both verbs thus describe rather the “going on” of animals, a “manifestation of becoming, of continuous creation, or simply of *being alive*”.⁶³ This points to an understanding of locusts as part of a fauna which behaves in certain ways. Central Asian animal names follow both objectifying and “going on” classificatory orders. That the “going on” order is central to the understanding of swarms and flocks is also mirrored in the Uyghur expression *engiz qūchqāq* (stalk eloper) which lumps together locusts and sparrows for their shared habit of raiding the fields and finishing corn to the stalk.⁶⁴ In contrast to other *hasharot* that were considered bloodless and thus religiously illicit (*haram*) for human consumption, locusts were regarded as licit in Islamic schools of thought including the Hanafi school predominant in Central Asia. Nevertheless the sources available so far do not suggest they were eaten in Central Asia, at least not during the late 19th and early 20th centuries.⁶⁵

In cosmological respect, locusts held a somewhat ambiguous position. As can be seen from the initial quotation, they were ascribed a miraculous birth from a fish, a creation from either proto-human matter by divine intervention or as part of God’s overall creation of living beings. The two divine narratives of creation were each traced back to eminent, early Islamic authorities, Al-Ḥākim al-Tirmidhī as well as the second khalif ‘Umar ibn al-Khaṭṭāb.⁶⁶ Other popular narratives also relate the creation of the locust from “Adam’s earth”, authorising the account by tracing it through the third *khalif* ‘Uthmān to the Prophet Mohammad.⁶⁷ Besides their remarkable emergence, locusts fulfilled a specific task in the environmental imaginary and the cosmological order of things. Most prominently, they acted as a guardian of morale. Like other kinds of natural disasters which were beyond human control they were regarded as a visitation, a divine punishment for human misdeeds and shortcomings. Locusts were widely referred to as “God’s whip” (Rus. *bozhiĭ bich*).⁶⁸ Behind this expression is probably the allusion that mundane authorities punish wrongdoers by flogging and so does God through the locusts. The punitive role of the locust has some Koranic backing in Sura 7:133 where they are enumerated as one of the plagues sent by God to Moses’s enemies in Egypt as a premonitory omen but the narrative characteristics of the trope prevalent in Central Asia probably has local roots. An interesting proverb conveys the capacity to wreak havoc on humans through the

⁶² See for both verbs *O‘zbek tilining izohli lug‘ati*, 2 vols, (Moscow: “Rus tili” nashriyoti, 1981) and 5 vols, (Tashkent: Davlat ilmiy nashriyoti, 2008).

⁶³ Ingold, *Being Alive*, p. 174, emphasis in the original.

⁶⁴ See Gustaf Raquette, *Eastern Turki Grammar: Practical and Theoretical with Vocabulary. Mitteilungen des Seminars für orientalische Sprachen zu Berlin 15-17* (Berlin: Reichsdruckerei, 1912-1914) for *engiz qūchqāq*.

⁶⁵ In the Arab Peninsula and North Africa locusts were eaten and considered healthy. In Syria, locusts were usually not eaten but were consumed as famine food (Augustin Calmet, *Dictionary of the Holy Bible* (Boston: Corcker & Brewster, 1832), p. 635). They were eaten by Bedouin, though (Lothar Kopf, ‘Djarād’, in *Encyclopaedia of Islam (Second Edition)*, vol. II, (Leiden: Brill, 1991), p. 455).

⁶⁶ See on them Marquet, ‘Al-Tirmidhī’ and Giorgio Levi Della Vida/Michael Bonner, ‘‘Umar (I)’, in *Encyclopaedia of Islam (Second Edition)*, vol. X, (Leiden: Brill, 2000), pp. 818-821.

⁶⁷ D[mitriĭ] N. Logofet, *V gorakh i na ravninakh Bukhary (ocherki Sredneĭ Azii)* (St. Petersburg: Berezovskiĭ, 1913), p. 64.

⁶⁸ Logofet, *V gorakh i na ravninakh*, p. 64, Laura Berdikhojayeveva, ‘Normalizing Agriculture: Fight against Sarancha in Russian Turkestan’ (Unpublished term paper, Nazarbaev University Astana, Kazakhstan, without year), p. 4.

mouth of the locust: “We are soldiers of the living God. We lay 99 eggs but if we had laid 100 we would have eaten up the whole world”.⁶⁹ The (self-)appellation as soldiers follows a popular narrative trope well established since Mongol times. Locusts and ants were used for evoking the image of hostile, marauding troops which adds yet another flavour to the divine mission of the insects.⁷⁰ This saying recalls as much their punitive function as divine soldiers as their obedience to God who even cares for sinful humans and thus would not give the locusts entirely free hand. Another locust narrative tells how the Prophet Mohammad, afraid of this dreadful whip interceded with God on behalf of the humans and asked him to either completely destroy the locusts, or if this was impossible to at least reduce their mouth to half its size. God, hearing the prayer of his prophet sent the angel Jabrā‘īl (Gabriel) to convey the message that the mouth and mandibles of locusts had been diminished to half of its former size.⁷¹ Thereby the locusts remained a purposeful element of cosmology and environment and humans, however punished, were assured to be ultimately protected by God. A locust invasion was thus less perceived as a pest outbreak (as in colonial reports) than framed as a misfortune (*ofat*). Parallel to this punitive and premonitory role, locusts also symbolised plenty. In the very popular Central Asian version of the Stories of the Prophets, the worms that had eaten the flesh of the prophet Ayyūb (Job) during the ordeal probing his faith finally turned into golden locusts and “were heaped on Job’s head like rain.”⁷² It was also said that their extinction was to herald the end of the world.⁷³

Fighting the heaven-sent insect? Local responses and the politicisation of locust combat

The perception of locusts as a heaven-sent visitation was a double-edged sword: while it made sense of unpredictable agricultural damage and incorporated it into an order of higher value, it also theoretically turned every locust combat into an anti-divine activity. In spite of the religious exaltation, peasants feared the locusts. The insects also posed a serious threat to food security and economic branches dependent of agricultural products. Anti-locust measurements before the onset of chemical pest control remained modest, however. Farmers knew from experience that grasshoppers remained in the steppes as long as they found enough fodder and that locust outbreaks usually collapsed after a few years.⁷⁴ Ploughs, mattocks and brooms were used to dig up egg pods which could be destroyed on the site. Schleich calculated that on average one person could dig up between one and two kilogram of pods.⁷⁵ With each kilogram consisting of ca. 1,600 pods of 50 eggs each, around 80,000 future locusts could be destroyed per day and person. These numbers remain equally optimistic and speculative. Often, the hatching grounds lay in areas not easily accessible. The importance of the rosy starling in devouring locusts was known among farmers. The birds usually ap-

⁶⁹ *Turkestanskii sbornik*, ‘Voina s sarancheū’, vol. 464, 72. The same narrative was told to Logofet in the locust-ridden hinterland of the town of Khuzār (Logofet, *V gorakh i na ravninakh*, pp. 64-65).

⁷⁰ See Andreas Wilde, *What is beyond the River? Power, Authority and Social Order in Transoxania, 18th-19th Centuries*, 3 vols. (Vienna: Verlag der Österreichischen Akad. D. Wiss., 2016), p. 186, fn. 592.

⁷¹ Logofet, *V gorakh i na ravninakh*, p. 65.

⁷² Al-Rabghūzī, *The Stories of the Prophets. Qiṣaṣ al-Anbiyā’*. *An Eastern Turkish Version*, eds Hendrik E. Boeschoten, M. Vandamme and Semih Tezcan, transl. Hendrik E. Boeschoten, J. O’Kane and M. Vandamme. Vol. 2, (Leiden et al.: Brill, 2015), p. 248.

⁷³ *Ibid.*, p. 279.

⁷⁴ *Turkestanskii sbornik*, ‘K saranchevomu voprosu. Agronomy i entomologi’, vol. 497, 144.

⁷⁵ Schleich, *Die geographische Verbreitung*, p. 37.

peared around early April from their wintering grounds in India. If weather conditions on their route or in Central Asia were unfavourable, their arrival could be delayed into May. By this time locusts would usually already have hatched, moulded and moved into the fields.⁷⁶ Apparently local populations had also dug irrigation channels into uncultivated steppe land to attract the water loving rosy starlings to the hatching places of locusts; by the time Serebrennikov visited in 1929, these irrigation channels were in disuse and overgrown.⁷⁷ Since rosy starlings continued to plunder vineyards and fruit plantations after the main locust season was over, they were also a bone of contention between farmers and winegrowers.⁷⁸

Another measure was digging trenches near those zones where newly hatched locust nymphs or egg pods had been sighted. Nymph-stadium locusts are unable to fly until they develop into the full adult imago. Taking advantage of this, people sought to detect the nymphs in time; they were then swept up with brooms or cloaks and driven into the trenches. For driving the non-volant nymphs, groups of the wingless hoppers were surrounded by a ring of people who drew nearer and finally forced the hoppers into a trench where they were battered, trampled down or buried with earth.⁷⁹ Creating the trenches was tedious work and required a huge workforce. People were drawn together from several neighbouring communities, in cases by compulsion. Nevertheless, there was always a shortage of workers, especially in sparsely populated areas. Uvarov had serious doubts about the effectiveness of this method.⁸⁰ Apart from the enormous workforce employed for digging trenches and driving a marching band of nymphs into them that was bent on moving elsewhere, some hoppers would always break through the human lines or escape hidden beneath stones and clods. Once volant locusts appeared, there was not much left to be done to prevent the harm. In case the locusts appeared early during the agricultural cycle and ate away the crops, peasants tried to substitute the loss by sowing anew. In summer 1904, locusts invaded large parts of eastern Bukhara. When the insects had eaten away all the barley and wheat, peasants around the town of Qabodiyon (today southern Tajikistan) decided to harvest the remaining stalks which they used as fodder for their animals. Then they replanted the fields with rice hoping that the locusts would disappear before the rice sprouted. This would allow them to get themselves and their animals through the winter.⁸¹ The decision to plant rice instead of other crops may also have been spurred by the observation that locusts avoided the rice paddies because of the water.⁸²

Dense population, intensive agriculture and traditional land use practices largely seem to have prevented successive, long-term locust outbreaks prior to the mid-19th century. This was partly be-

⁷⁶ M.K. Serebrennikov, 'Der Rosenstar, seine Lebensweise und Bedeutung in Uzbekistan', *Journal für Ornithologie* LXXIX 1 (1931): 31-32, 55.

⁷⁷ *Ibid.*, 51-52.

⁷⁸ *Ibid.*, 49-51.

⁷⁹ Schleich, *Die geographische Verbreitung*, p. 39. Battering or trampling down the locusts was extremely malodorous as a photo on locust combat in Palestine in 1930 and its commentary as well as reports from the American Colony in Jerusalem on the locust combat of 1915 show (<https://www.loc.gov/item/mpc2004002266/PP/> and <https://www.loc.gov/collections/american-colony-in-jerusalem/articles-and-essays/the-locust-plague-of-1915-photograph-album/>, retrieved 07.11.2017).

⁸⁰ Uvarov, *Locusts and Grasshoppers*, p. 175.

⁸¹ Yusupov, *Ocherki istorii Kuliabskogo bekstva*, p. 42.

⁸² See Varygin, 'Opyt opisaniia Kuliabskago bekstva', p. 795.

cause locusts avoided disturbed soils for oviposition but also because their eggs and larvae if laid into worked fields at all drowned in the irrigation water.⁸³ Where fields were left fallow for soil recovery, black fallow was practiced: the soil was tilled (and thus not undisturbed) but not sown.⁸⁴ The main reason for this was to prevent bushes, shrubs and weeds from growing whose removal was time and labour consuming. Black fallow moreover discouraged locusts from depositing eggs in the coarse furrows.⁸⁵ Only abandoned fields were not taken care of at all. A three-field system seems to have been practiced where possible⁸⁶ whereas in some places fields never lay fallow, possibly for land shortage.

Some effort went into apotropaic measurements. Mullahs sold amulets to peasants which were meant to protect the fields from locusts. These usually consisted of pieces of reed stuffed with Arabic religious formulas (e.g. *Bismillāh al-raḥmān al-raḥīm*, *Allāhumma*, *Salla Allāh Sayidinnā Muḥammadin*) written on a piece of paper. The amulet was then buried in the field.⁸⁷ Another kind of amulet was the so-called *risāla* of agriculture (*risāla-yi dehqānī/dehqāncīliq*). It belonged to a text genre which existed for a large range of professions and was a sort of manual of ethics and morals for the profession.⁸⁸ Generally speaking, no matter what the profession was, the texts were already considered to transmit divine blessing (*barakat*) and to be an amulet. In the case of agriculture, some texts specifically stress their anti-locust faculties. One lithograph is even explicitly titled “*risāla* of agriculture with prayers [against] locusts”.⁸⁹ Interestingly, content-wise this *risāla* says nothing about locusts or specific prayers against them at all. It is a text well embedded within the master narrative and general framework of the *risāla*-texts of agriculture. Among these, the majority did not mention locusts or their own locust preventing properties at all. Even the *risāla* IVRUz-1 7287/5 (fols 359b-360a), one of the most outspoken apotropaic texts of this genre, speaks only about its inherent faculties to prevent bodily ailments such as blindness, deafness and bone fractures, and economic harm from bankruptcy etc.⁹⁰ The conspicuous omission of the locusts in the *risāla* again suggests that locusts were perceived to be of a similar kind as other natural disasters, e.g. earthquakes, floods or droughts which were likewise taken to be visitations and thus had to be accepted. Framing locusts as visitations did, however, not imply that generally no measurements were taken against them or asked for from local officials.⁹¹

⁸³ See Wawrzyn L. Golab, ‘A Study of Irrigation in East Turkestan’, *Anthropos* 46/1-2 (1951): 197.

⁸⁴ Useful as this method was for shrub control, it may also have had detrimental effects exposing the soil to wind and water erosion (see Moon, *The Plough that broke the Steppe*, pp. 147-148).

⁸⁵ Schleich, *Die geographische Verbreitung*, p. 38.

⁸⁶ Becker, *Russia's Protectorates*, p. 309, fn 59.

⁸⁷ *Turkestanskii Vedomosti*, 13 Jan. 1902 (N° 24), 141.

⁸⁸ See Jeanine Dağyeli, “Gott liebt das Handwerk“. *Moral, Identität und religiöse Legitimierung in der mittelasiatischen Handwerks-risāla* (Wiesbaden: Reichert, 2011), pp. 64-67.

⁸⁹ IVRUz N° 751, Lithograph, *risāla-yi dehqānī ma'a du'ā-yi chūkürdkā* (*risāla* of agriculture with prayers against locusts), Al-Biruni Institute of Oriental Studies of the Academy of Sciences of the Republic of Uzbekistan.,

⁹⁰ IVRUz-1 7287/5, manuscript, *risāla-yi dehqānī* (*risāla* of agriculture), Al-Biruni Institute of Oriental Studies of the Academy of Sciences of the Republic of Uzbekistan. See B. Babadjanov et al. (eds.), *Handlist of Sufi manuscripts in the holding of the Oriental Institute, Academy of Sciences, Republic of Uzbekistan (Biruni)* (Berlin: Das Arabische Buch, 2000), N° 1754 and Jürgen Paul, *Katalog sufischer Handschriften aus der Bibliothek des Instituts für Orientalistik der Akademie der Wissenschaften, Republik Usbekistan* (Stuttgart: Franz Steiner, 2002), N° 168.

⁹¹ *Turkestanskii sbornik*, vol. 497, 151.

To most Russian colonisers, the environmental imaginary of Central Asia served as a metaphor of timeless, stubborn backwardness. This view was in part nourished by a certain Russian discourse over cultural identity which sought to contrast forests and fertile steppes as intrinsically Russian or European with arid, barren lands being the emblematic Asiatic Other.⁹² The Russo-European environment was, however, conceived as being under constant “oriental threat”, be it sandstorms, soaring heat or locusts. Locust combat was a number one issue for the Russian colonial administration. Besides fear of food insecurity and fodder scarcity, it is probably safe to assume that a possible harm to the emerging cotton industry aroused the most anxiety. The danger of peregrine locusts entering Russian territories by way of Central Asia also loomed. The importance the colonial administration attached to this agricultural threat can be seen by numerous newspaper articles, opinion pieces, agricultural manuals and notifications of imminent locust swarm. The language applied when speaking of the insects is revealing. They are variously called enemy (*vrag*) and pest or vermin (*vreditel'*) in Russian language publications. It is, however, equally obvious that the Russian administration was unsure what kind of animal they dealt with and which locust species really posed a danger. In 1898 the colonial administration started to investigate the nature of the insect.⁹³ The main difference following from observations of the habitat was made between Migratory and Moroccan locusts. Some classified all Central Asian locusts as either Migratory (i.e. innocuous) or Moroccan (i.e. harmful).⁹⁴ Attempts to predict gregarious behaviour and swarming led to scholarly beliefs in a twelve year cycle ruling the emergence of locusts. This opinion was said to be confirmed by local elders. Looking at the latter's statement carefully, they rather referred to being haunted by locusts already for twelve years than to any periodicity.⁹⁵ In 1899, the entomologist Konstantin N. Rossikov published a book on the “Migratory or Asiatic locust” which sought to further specify the enemy.⁹⁶ In 1914 V.I. Plotnikov published a book on agricultural pests in Turkestan in which the author distinguished several locust species but attributed serious crop damage only to the Italian and Moroccan locust as well as the Atbasar grasshopper while he assumed the Migratory locust to be of minor importance in Central Asia.⁹⁷ With the arrival of Rossikov in Tashkent, the fight against the “verminous locust insects” gained momentum. In 1904, a “Locust Committee” was set up in Russian Turkestan upon his instigation.

There were annual calls upon the population to look out for locust eggs, collect them and hand them over for destruction. This task was carried out by corvée workforces and called “natural obligation” (*natural'naia povinnost'*).⁹⁸ Compulsory labour of this kind was in fact prohibited throughout the Russian Empire by a law issued in 1886. This law was, however, disregarded by the local administration in Russian Turkestan. In 1896 an appeal was made to the privy council to lift the ban on

⁹² Moon, *The Plough that broke the Steppe*, p. 163.

⁹³ Berdikhojayeva, ‘Normalizing Agriculture’, p. 6.

⁹⁴ *Turkestanskii Sbornik*, vol. 497: 141.-143.

⁹⁵ *Turkestanskii sbornik*, vol. 497, p. 144.

⁹⁶ Konstantin N. Rossikov, *Pereplētnaia ili aziatskaia saranchi v ee gnezdilishchakh i novyi sposob ee unichtozheniia* (St. Petersburg: Tip. V. Demakova).

⁹⁷ Plotnikov, *Nasekomyia*, pp. 195-213. V.I. Plotnikov (1877-1959) established the entomological station of Tashkent in 1911. In his book from 1914 the Desert locust and *Paracyptera microptera turanica* are not mentioned while Beĭ-Bienko and Mishchenko (*Saranchevye fauny SSSR*, p. 69) regard them among the most important species in Central Asia.

⁹⁸ Berdikhojayeva, ‘Normalizing Agriculture’, p. 5.

corvee labour in Turkestan; this appeal was rejected by the council. The council of the general governor of Turkestan, a subordinated body, ignored the higher council's ruling and decided in 1908 that "natural obligation" was the only way to fight locusts in Turkestan.⁹⁹ "Natural obligation" corresponded to a similar Central Asian labour mobilisation called *hashar*. Even though the labour itself was not paid, the workmen were entitled to food and there were rewards paid for certain amounts of collected eggs. In Pskent county (*uezd*) in Russian Turkestan, the population was obliged to deliver three *funt* (approx. 1,2 kg) of locust eggs for each rouble paid to them out of tax revenues.¹⁰⁰ The organisation of these measures was ceded to local village elders (*aqsoqol*) and colonial administrators on a mid-level territorial unit (*uezd*).¹⁰¹

Ploughs were also used. Two to three large sacks were tied to the plough and driven towards the moving direction of the locusts. When the sack was filled, it was again thrown into one of the trenches and burned with kerosine. Alternatively, fields or pastures already taken over by the insects were burned. This took place in the evenings after the animals had stopped wandering around and sat down on the plants.¹⁰² Uvarov, however, discards this method as very unreliable saying that this rendered only "an illusory result (I am speaking from experience), since only a small percentage of the hoppers is actually burnt, the rest simply scattering over a large area, only to congregate again after a day or so."¹⁰³ He likewise disapproved of flame throwers introduced in Turkestan. These consisted of a reservoir filled with petrol and carried on the back. Its vapour emerging through coils surrounded by an iron muff was lighted and directed onto the hoppers. Although used in great numbers, these flame throwers were abandoned after some men who carried them suffered fatal accidents.¹⁰⁴

A method introduced to make communal labour more effective was to employ zinc or tin sheet walls which blocked the way of the crawling nymphs. According to Schleich, Riccardo Mattei, one of the most distinguished landowners in locust-ridden Cyprus, invented this method around 1860.¹⁰⁵ By the time the Russians became interested, this method had already been tested by the French in Algeria; Rossikov was apparently impressed and advocated it for Central Asia. The metal sheets were made from tinned iron of roughly 1½ metres (2 arshin) long and 35 cm (1/2 arshin) thick.¹⁰⁶ Since pure iron sheets would have put on rust which would have provided uneven spots allowing the insects to get over the wall, it was indispensable for the success of the operation that the sheets were tinned. The top of each sheet ended in a pipe. The sheets were joined to form a wall. Two rows of walls were joined to form an obtuse angle where a trench was dug. The construction was erected across the route of the hoppers. The non-volant nymphs could not climb the unruffled metal wall but were driven along the wall and into the trenches where they were either buried or burned

⁹⁹ *Turkestanskiĭ sbornik*, vol. 497, p. 150-151.

¹⁰⁰ *Turkestanskie Vedomosti*, 13 Jan. 1902 (N° 4), 23.

¹⁰¹ Berdikhojajeva, 'Normalizing Agriculture', p. 7.

¹⁰² *Ibid.*, p. 9.

¹⁰³ Uvarov, *Locusts and Grasshoppers*, p. 174.

¹⁰⁴ *Ibid.*, p. 175.

¹⁰⁵ Schleich, *Die geographische Verbreitung*, p. 40. Some vague sources claim that Mattei did in fact not invent the method but imported it from Algeria where it had allegedly been known »since the time of the pharaohs« (<https://perithorio.wordpress.com/2017/08/29/riccardo-mattei>, retrieved 07.11.2017).

¹⁰⁶ Plotnikov, *Nasekomyĭa*, p. 207.

with kerosene. Once the operation was over, the walls were disassembled and brought to the next endangered place. The method was regarded as highly efficient.¹⁰⁷ Visiting Central Asia in 1896 and 1901-02, Annette Meakin spoke with point-blank pride about “a method that we English have adopted with so much success in Cyprus” which would hopefully make it one day to Central Asia,¹⁰⁸ notwithstanding the fact that the person who had popularised the method in Cyprus was a Smyrna born Cypriote with Italian roots.

The Russian administration also dedicated considerable means to then up-to-date insect control which included the use of Vermorel machines.¹⁰⁹ Their import was heavily promoted by Rossikov who had convinced himself of their efficacy in Algeria. The Russians had sent an officer to see Vermorel in France in 1901. He brought back ten douches designed to spread the patented insecticide, and an order of one hundred more had been placed.¹¹⁰ When a locust threat was imminent in the Katta-Kurgan region in 1902, five horse-driven and ten manually operated Vermorel machines were imported. The neighbouring Bukharan Emirate with its Russian protectorate status initially remained out of these anti-locust schemes. The newspaper *Turkestanskije Vedomosti* from Russian Turkestan commented on this with a side blow at the Bukharan government: “In the Katta-Kurgan district up to 3,000 pud [almost 50 tons] of locust eggs have been collected. Five horse-driven and ten manually operated Vermorel have been procured for the district but there is fear that all the efforts of the locust campaign in the district are paralysed because locusts from the Bukharan dominions – where not a single action for their elimination has been implemented – will fly [to Katta-Kurgan].”¹¹¹

With the newly acquired Vermorel machines, various insecticides were used against freshly hatched locusts: if the place where they appeared was covered with vegetation, either Paris Green (an arsenic toxic), sodium arsenite or crude arsenic mixed with molasses were applied.¹¹² This was especially recommended for fighting the Italian locust; the poison was to be spread on lynchets, either onto the grass growing there or mixed with freshly cut alfalfa if there was no fresh vegetation on the spot.¹¹³ All of these poisons were contact poison. Arsenic compounds had, however, one disadvantage. Their liquid solubility greatly reduced their efficacy even in light rain. Paris or Urania Green by contrast was insoluble in water. It was sold pulverulent which enabled an efficient dispersal. It could also be spread mixed with water by spray machines or scattered as toxic bait mixed with alfalfa, bran or manure. Pomace, chaff and sawdust were also accepted by locusts.¹¹⁴ Oil cake,

¹⁰⁷ Schleich, *Die geographische Verbreitung*, p. 40.

¹⁰⁸ Meakin, *In Russian Turkestan*, p. 198.

¹⁰⁹ Etablissements V. Vermorel (1843 – 1965) was a French engineering business situated in the Lyon region which originally produced agricultural machinery. The machines mentioned here were used for spraying sulphur based insecticides.

¹¹⁰ Meakin, *In Russian Turkestan*, p. 198.

¹¹¹ *Turkestanskije Vedomosti*, 27 Jan. 1902 (N° 8), 47.

¹¹² A US farmers' bulletin mentions commercial mixtures for grasshopper control which contained 2 gallons of cane molasses and 2 quarts of sodium arsenite (4-pound material). 2 1/2 gallons of this mixture poured into 10 to 12 gallons of water were sufficient for 100 pounds of bran which was then, apparently, spread evenly over infested fields as a bait (J.R. Parker and William Randolph 'How to control grasshoppers in cereal and forage crops', *Farmers' Bulletin* N° 1691 (1932): 8-10. <https://archive.org/details/CAT87204014> (retrieved 18.01.2016).

¹¹³ Plotnikov, *Nasekomyĭa*, p. 201.

¹¹⁴ Schleich, *Die geographische Verbreitung*, p. 41.

a by-product of cotton processing, was soddened with arsenic and scattered early in the morning among the locusts resting on stones and plants to regain temperature after the night. Soon after the insects had devoured the oil cakes, they started to wobble and fall. Many poisoned locusts were carried off by the water of irrigation channels and accumulated in layers on the sandbanks.¹¹⁵ The toxic was transported by locals on horseback from one place to the other in large cans. In mid-April 1912, the inhabitants of several villages in what is today southern Tajikistan received all in all 25 Roubles and 20 Copecks for their transport services. They had delivered 14 large canisters of insecticides on 7 horses led by 3 guides. There were no safety precautions whatsoever for the local population engaged in the transport and use of these insecticides; it was not yet known that sodium arsenite is toxic and teratogen. Some Russian contemporary scientists, however, already suspected the chemicals to be harmful to the ecosystem, for example the rosy starlings.¹¹⁶ Serebrennikov observed that rosy starlings on his second expedition in 1930 were weak, relatively few and disinterested in breeding their fledglings which he attributed to an unfortunate combination of a late, cold spring and a scarcity of locusts due to chemical pest control.¹¹⁷

The locust fight was also the site of a grim fight between the colonial administration and the ruling elite of the protectorate Bukhara. While the Russian administration urged the Bukharan government to invest more into locust control, the Bukharans hesitated and put forward reasons why they would not take action. At first glance, this tug of war seems like the confirmation of colonial Russian prejudices towards Central Asians: the Bukharans argued that locusts were living beings created by God and must therefore not be burned, that they were sent by God as a visitation because of human faults and sins and similar religiously underpinned arguments. These were surely sincere concerns for many. Fierce opposition against the Russian-led locust combat came from parts of the clergy. However, behind the facade of religious reservations more mundane considerations also lurked in the background. In 1908, the Bukharan emir Abdulahad blamed the Russians of colonising his dominions under the pretext of locust combat. Sadriddin Aini, a contemporary writer and intellectual noted that much of the hesitation on the Bukharan side was rooted in the anticipation that the Russian administration wanted to shift financial obligations from the locust combat on to them: “In one year [i.e. 1909] locusts had laid their eggs in dominions belonging to Bukhara. In order to prevent a likely transgression of locusts from the Bukharan region in the direction of Katta-Kurgan and Samarkand, the Russian government sent a commission to the Bukharan dominions with equipment to eliminate the locusts. But the commission demanded [the expenses for] the fight from the Bukharan government. The Bukharan government handed the matter over to the ‘Ulamā and asked for a fatwa. The ‘Ulamā issued the following fatwa: Locusts are a living being and according to the sharī‘a it is not licit to burn them. The government of Bukhara rejoiced in this fatwa because it had saved them from the costs of locust incineration.”¹¹⁸ The opposition of parts of the clergy against locust incineration was, however, exaggerated in Soviet history writing and depicted as yet another

¹¹⁵ Serebrennikov, ‘Der Rosenstar’, pp. 29-30.

¹¹⁶ *Turkestaniskii Sbornik*, vol. 497, 163.

¹¹⁷ Serebrennikov, ‘Der Rosenstar’, p. 55.

¹¹⁸ Sadriddin Ayni, *Bukhārā inqilābīning ta‘rīkhī*, eds. Shizuo Shimada and Sharifa Tosheva (Tokyo: TIAS, 2010), p. 192.

indicator that the Bukharan religious class was thoroughly backward, superstitious and against public progress.¹¹⁹ Looking at the names of those locally engaged in the locust combat, we get a more balanced picture. Local clergy were indeed involved as for example Mullo Iso Mirokhur shows, a clergyman and Bukharan official in the province of Kabadian who received 1 Rouble 50 kopeks for his services in 1912.¹²⁰

Finally, faced with deteriorating conditions in the emirate, Russian pressure and the out-migration of an economically ruined peasantry to Afghanistan, Russian Turkestan and other places, the Bukharan emir consented in spring 1909 to Russian locust fighters and equipment on his territory. From spring 1911 onwards, large-scale anti-locust campaigns were carried out in the emirate.¹²¹ Under the supervision of Russian officers and engineers, local inhabitants were employed for the locust fight and the observation of imagoes. The workers received a compensation in kind for their efforts, local officials small sums of money. The whole undertaking was paid for by the Bukharan treasury; the expenses being around 300,000 Rouble each year.¹²² Reports on reactions of villagers are mixed. A contemporary Russian observer noted the positive impression Russian locust fighters had made on the local population. “There was never any kind of complaint to be heard that Russians meddled in their affairs or that they went against God’s volition”.¹²³ Apparently, many rural inhabitants, tired from digging trenches and willing to rather let locusts eat away their harvest to escape this tedious task embraced the new technologies.¹²⁴ When around 1910 locusts appeared in the province of Khuzār, the issue was given such an importance that the minister of finance, one of the most authoritative officials in the emirate, was entrusted with overseeing the fight against the insects.¹²⁵ In other localities rejection prevailed. The first Tsarist locust fighters appeared in Eastern Bukhara during a time of internal strife. Between 1905 and 1920 a series of rural uprisings was under way and although they were probably sparked by failed harvests and deficient administrative measurements against rural impoverishment and indebtedness, they also spread in areas where Russian locust fighters had been sent to. Locust fighters were apparently attacked with clubs, beaten and sometimes killed by the local population. This sounds bewildering at first. Taking the circumstances under which locust campaigns took place into account renders a less strange picture. The workforce in the campaigns consisted predominantly of *corvée* labour. In those instances where Russian locust fight supervisors were attacked, local workers had had to contribute to the locust fight without payment and on insufficient food rations. Since they had not been told the higher rationale of the measurements either and given the hostile stance of the Bukharan establishment towards the anti-locust activities, their anger about compulsory work and lack of food turned against

¹¹⁹ See for example Sharqi Yusupov, *Ocherki istorii Kabadianskogo bekstva v konce XIX – nachale XX veka* (Dushanbe: Donish, 1986), pp. 42-44

¹²⁰ *Ibid.*, p. 44. Based on documents from the Central State Archive of the Republic of Uzbekistan, F 3, op. 1, d. 470/a.

¹²¹ Yusupov, *Vakhshskaia dolina*, p. 44.

¹²² Yusupov, *Ocherki istorii Kabadianskogo bekstva*, pp. 43-44.

¹²³ P. Gaevskii in Yusupov, *Vakhshskaia dolina*, p. 44.

¹²⁴ Berdikhojayeva, ‘Normalizing Agriculture’, p. 9.

¹²⁵ Muḥammad Sharīf-i Ṣadr-i Ziyā, *The Personal History of a Bukharan Intellectual. The Diary of Muḥammad Sharīf-i Ṣadr-i Ziyā*, eds. Edward A. Allworth et al. (Leiden: Brill), pp. 320, 335. The author indicates, however, that the emission of the minister may also have been spurred by fears of him instigating troubles in Bukhara and thus relegating him to the province (*ibid.*, p. 335).

the Russian locust fighters.¹²⁶ Uvarov also turned against this practice and speaks of the demoralising effects of forced labour which was in its majority drawn from already suffering, immediately afflicted communities.¹²⁷ Besides, outbreak areas were often in areas whose populations were not engaged in agriculture and therefore uninterested in the issue of locust control. Peasants who were forced to abandon their agricultural work for weeks in the course of locust combat away from their localities were in danger of losing even those crops from neglect that were initially spared by the locusts. Since no sanctions were to be expected for poor work except dismissal (which was – in Uvarov’s view – what the *corvée* labourer secretly hoped for), there were no incentives for good work. Given their real duty and lack of payment, the workers could not be made to take part in the whole locust campaign. Necessary training in locust combat methods was time-intensive, however. With their return to their own fields, eventually they had to be substituted by new, unskilled labourers who again needed to be trained which was a waste of time and money to Uvarov who was convinced that these investments would yield better returns if the workers were paid.¹²⁸

Conclusion

Debates about locusts, their nature as well as their place in the world and in cosmology reveal much about environmental imaginaires, human-animal relations and ideas about progress. The fight against locusts was one of the flash points where Central Asian and colonial political aspirations and cosmological understandings of the world converged, or often rather clashed. The problem locusts posed to agriculture and the dispute about the best way to fight them left a considerable paper trail on the colonial side, less so in Bukharan archives. Locust outbreaks were traditionally perceived as divine visitation and Bukharan officials were neither seen as capable nor responsible for organising anti-locust measurements. Thus they were not petitioned on this issue. Only the pressure exerted by the colonial administration on Bukhara to join their anti-locust activities brought dealings with the insects into local, written sources.

The Central Asian imaginary of the non-human world was complex and often inconsistent; indeed there was no aspiration for standardising all the different local conceptualisations of animal, plant, spirit and inanimate elements of the environment. Taxonomies of locusts as of other animals followed various schemes, among others one that classifies beings according to their behaviour which leads to very different perspectives on locusts and other raiders of the fields. The utilitarian, technocratic perspective that came to dominate discourse and practice depicted locusts (and other natural disasters) in a very simplistic cause-effect argumentation as reason for widespread rural dissatisfaction, hunger and resulting rebellions. Born out of a colonial, modernist narrative of passive Central Asians helpless in the face of a congeries of natural forces, this trope continued to flourish in Soviet

¹²⁶ Aleksandr A. Semënov, ‘Vosstaniia protiv pravites’stva v XIX – nachale XX vv.’, in A. Mukhtarov (ed.), *Iz istorii narodnykh dvizhenii v Srednei Azii* (Dushanbe: Donish, 1988), p. 33.

¹²⁷ Uvarov, *Locusts and Grasshoppers*, pp. 178, 206-207.

¹²⁸ *Ibid.*, p. 206.

publications.¹²⁹ Establishing itself in the early twentieth century, this discourse largely set the parameters for research on the topic.¹³⁰

Essential changes in the way of thinking about locusts and – beyond – about their place in the environment and the religious-cosmological order did not come immediately. The colonial, technocratic view of locusts as a major hazard for development introduced a shift, though, from supernatural to scientific explanations of why locust invasions happen at all. The discourses and practices it triggered set parameters that continued into the Soviet and post-Soviet eras. Taking the locust as example teases these tensions out well because on a mundane level, there was no question that the insect was disliked and feared on all sides. This directs the attention to larger issues lurking in the back of pest-control, namely colonial power-plays vis-à-vis the vassal state Bukhara, and sense-making of the world. Looking at the human-environment interplay through a small insect allows us to examine colonial tropes, local attitudes towards crisis as well as internal frictions in the Bukharan society that eventually set off a paradigmatic change. In its course, the disenchanting locust, stripped off its former, supernatural role, was relegated to a vermin status in a new, disenchanting, anthropocentric view of nature. .

¹²⁹ See for example Yusupov, *Ocherki istorii Kuljabskogo bekstva*, p. 98.

¹³⁰ See Diana K. Davis, 'Introduction', in Diana K. Davis and Edmund Burke III (eds.), *Environmental Imaginaries of the Middle East and North Africa*, pp. 1-22 (Athens, Ohio: Ohio University Press, 2011), p. 3.