Cultivating the Steppe: The Origins of Mennonite Farming Practices in the Russian Empire

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Introduction

Mennonite farmers were among the pioneers of successful practices for cultivating grain in the fertile soil but semi-arid climate of the steppes of the Russian Empire. Most notable were the farmers of Molotschna (also, Molochna) in "New Russia" (today's southern Ukraine), the main subjects of this article.[2] By the mid-nineteenth century, in most years in Molotschna, Mennonites were obtaining good and relatively stable yields of high-quality grain in a region where, until the mid-1830s, they had struggled with the recurring droughts. This article, which focuses on the period to the 1850s, analyzes the reasons behind the Mennonites' success. It also asks whether their motivations included a concern for what we now term "the environment". Thus, this article contributes to Mennonite environmental history. Around a decade ago, Royden Loewen noted the dialectical relationship between Mennonites and the

land: "Mennonites left an imprint on the land, but the land also had its affect on them."[3]

The main part of this article is presented in two sections. The first considers the practices for cultivating grain introduced by Mennonite farmers in Molotschna in the 1830s; the second analyzes the wider contexts in which the Mennonites developed the practices and the motivations behind them. The article is based on a range of primary sources including reports by Mennonite leaders to the Russian authorities, studies of Mennonite agriculture by visiting specialists, and articles by Mennonite and Russian authors published in contemporary Russian agricultural periodicals and preserved in archives in Russia and Ukraine. It also draws on the recent edition of the correspondence of pioneering Mennonite farmer and leader Johann Cornies.[4] Reference is made to a selection of the extensive secondary literature on the Mennonite colonies and steppe farming. In keeping with recent Ukrainian scholarship, the Mennonites are considered as part of the wider population of southern Ukraine.[5]

The Mennonites attracted great praise for their success in farming at the time with visitors extolling their achievements. The German Baron August von Haxthausen, whose travels around the Russian Empire in 1843-4 included a visit to Molotschna, emphasized what he saw as their personal qualities:

> Agriculture [in the Russian Empire] is very much behind its condition in Germany; the Mennonites alone form an honourable exception; their farming is excellent, and they exercise a great influence upon all [those] around them, Russians included, serving as a model to them in their moral bearing, honesty, clear practical understanding, intelligence, and knowledge of all the branches of agriculture.[6]

Haxthausen was hardly impartial. He considered the Mennonites to be Germans and felt himself at home in their colonies.[7] Although he travelled to Russia to look at Slavic rural communal institutions, which he believed maintained social cohesion in Russia in contrast to an unstable, urbanizing, western Europe, in places his account betrays a sense of German superiority.[8]

Another German who visited Molotschna was Dresden-born Alexander Petzholdt. From 1846 to 1872 he held the chair in Agriculture and Agricultural Technology at the Baltic German university in Dorpat, Livonia, in the Russian Empire's Baltic provinces.[9] Petzholdt, whose travels around western and southern Russia in 1855 included the Mennonite colonies, admitted that he was "not a

friend of sects" and that he disliked "ostentatious religious talk", which he considered hypocritical, but noted that he found no such behaviour among the Mennonites.[10] Although he was aware of Haxthausen's glowing account, he made up his own mind and was also impressed. He wrote:

> This community offers the viewer a fascinating panorama; firstly on account of their German customs, German diligence, German thriftiness, which they have retained in the midst of Russians and Tartars in a way which other German settlers have not managed to do, so effortlessly and secondly when one observes what blessed influence these people exercise on their neighbourhood.[11]

Their farming practices struck him as exemplary:

> I regard the Mennonite agricultural system under the present circumstances as a very good one and I hope that these clever people will exploit it to their fullest advantage which I wish them from a sincere heart.[12]

"I am firmly convinced", he concluded, "that Russia has no more diligent and useful citizen than the Mennonite."[13] The very laudatory accounts by Haxthausen and Petzholdt, in particular their praise for German industriousness and order in contrast to their Russian neighbours, understandably proved controversial among some Russian observers.[14] Their obvious bias, moreover, casts doubt on their value in explaining the Mennonites' success in cultivating the steppe.

Nevertheless, other contemporary observers, including Russians, noted the Mennonites' accomplishments. In his report for the drought year of 1855, the government inspector of agriculture in the southern provinces reported that the Mennonite farmers of Molotschna had obtained a harvest-to-seed ratio for spring wheat of 7:1. This was over twice the yields by all foreign colonists in the region, and more than four times the average for all farmers. He praised the Mennonites for their "ordered and prudent" use of the land, their crop rotation, use of "black fallow", constant cultivation of the soil which assisted in conserving moisture, locating their fields near their villages to save time travelling between them, and planting trees around their fields to shelter them from the wind. He noted that foreign colonists made better use of local conditions of climate, soil, and trade than their Russian neighbours.[15] This was just one of many examples of praise for Mennonite farmers by Russian officials and agricultural specialists.[16] The success of the

Mennonite farmers has been noted by generations of historians, Mennonite and non-Mennonite, including recent Ukrainian scholars.[17]

The background to the Mennonite colonies in southern Ukraine is well known to readers of this journal and needs only a brief summary here. In the decade after 1789, over three hundred Mennonite families, mostly from the Vistula delta region around Danzig (today's Gdańsk in Poland), moved to the Chortitza (also Khortitsa) area in the Dnieper river valley. The migrants were escaping the demands of the Prussian government, which had recently annexed Danzig and the Vistula delta; Chortitza was in part of the southern steppe region that the Russian Empire had recently added to its domains and was seeking to settle. In a second wave of migration in the first decade of the nineteenth century, over three hundred and fifty families made a similar journey and settled on lands along the Molochna River and its tributaries to the southeast of Chortitza. The migrants were responding to invitations by Russia's rulers for foreigners to settle in the empire, in return for land and privileges. The Mennonite settlers were part of much larger groups who moved from central and also south-eastern Europe. Slav peasants – Orthodox Russians and Ukrainians – who had moved from farther north, joined the foreign colonists on the southern steppes.[18]

The settlement of Mennonites and others was part of a Russian policy of transforming the steppes that lay along or beyond the southern frontier and were inhabited by sometimes-hostile peoples with quite different, often nomadic, ways of life. The Russian authorities aimed to convert the steppes into territories with settled populations engaged in agriculture and firmly under Russian control. The agricultural settlers who moved onto the steppes did not settle on vacant land. As Mennonite historians acknowledge, the lands they were granted by the Russian government had recently been or still were the homes of other peoples. The Chortitza colony was established on lands vacated by the Zaporizhian Cossacks, who had either been deported by the Russian authorities or fled to Ottoman lands in the wake of their defeat in 1775. The Molotschna colony was set up on the lands of Nogai peoples, who lived mostly by grazing livestock, some of whom continued to live on adjoining lands.[19]

The environment of the southern steppe was characterized by fertile soils, including the famed black earth (*chernozem*), luxuriant grasses, but relatively low and unreliable rainfall, recurring droughts, heat waves, and high winds. For many centuries the

steppe had supported peoples who lived a nomadic way of life, moving between seasonal pastures with large herds of livestock.[20] In the late eighteenth century, the military threat from the nomadic peoples had receded. However, the settlers encountered considerable environmental challenges, in particular regular droughts, detrimental to establishing a culture based on settled, European-style agriculture.[21] The Mennonites had some success in dealing with these challenges.

Mennonite Farming Practices

This article focuses on the Mennonites' techniques for growing grain, although this was just part of their economy that included growing other crops, keeping silk worms, raising merino sheep, and planting orchards and forest trees, as well as developing, non-agricultural interests.[22] The Mennonites devised their farming practices under the auspices of the Russian authorities, who oversaw the settler activities through the "Guardianship Committee for Foreign Colonists in New Russia". The Guardianship Committee established several agencies to promote improvement in key areas: the Sheep Society in 1824; Forestry Society in 1830; and Agricultural Society in 1836.[23] The official support for the Mennonite economy was part of a wider policy of improving steppe farming among the entire population. An important role in developing agriculture in the region was played by the Southern Russian Agricultural Society, comprising mostly Russian landowners and agricultural specialists, which was founded by Governor General Vorontsov of New Russia in 1828. Russian government support for agricultural improvement in general can be traced back to the seventeenth century. It took steps forward with the founding by Catherine II in 1765 of the "Free Economic Society for the Encouragement of Agriculture and Husbandry", and in the nineteenth century with the expansion of scientific research institutions and regional agricultural societies. The "great drought" of 1832-4, which provoked a catastrophic harvest failure and famine across the steppe region, prompted the government to set up the Ministry of State Domains. It administered all state lands and the people who lived on them, including Mennonite and other foreign colonists. The ministry paid much attention to agriculture in general, including combating droughts.[24]

Under Cornies' vigorous leadership, in the late 1830s, following the great drought and crop failure a few years earlier, the Agricul-

tural Society introduced and enforced a series of improvements that led to the success of Mennonite grain cultivation. The key practices were: a) crop rotations and crops; b) techniques for cultivating the soil; c) black fallow (*schwarze Brache*); and d) shelterbelts of trees.

Crop Rotations and Crops

Until the late 1830s, like other farmers in the steppe region, Mennonites engaged in shifting, long-fallow farming. They cultivated areas of land for a few years until yields declined before leaving them fallow for several years and ploughing up new land. This extensive system was attracting criticism as it came under pressure from increasing population and was less productive than more intensive systems.[25] Cornies was part of this move away from extensive farming, which he thought risky, and which he associated with the nomadic peoples of the steppe, who he felt were at a "lower" level of development. He argued persuasively that the Mennonites of Molotschna should replace extensive farming with a regular rotation of crops.[26] From 1837, many used a four-field crop rotation (*vierfelder Wirtschaft*) in the following sequence: 1. barley; 2. spring wheat; 3. winter rye or oats; and in the fourth year, the field was left fallow.[27] In that same year, the change, implemented by about half of the settlements in the Molotschna colony, was noted with approval by Peter Köppen, an official of the Ministry of State Domains who inspected the colony, and urged other Mennonite farmers to follow their example.[28] The four-field rotation, with some changes, was still in use when Russian agricultural specialist Vladimir Postnikov visited the Mennonite colonies in 1881.[29]

The Mennonites were among the earliest farmers in the steppe region to replace long-fallow (the laying aside of land for multiple years) cultivation with crop rotations, which became more widespread over the following decades.[30] Another Mennonite practice, and one that was more distinctive, was fertilizing the fields, in particular the fallow field, with manure. Other steppe farmers were reluctant to do this as they felt the black earth was already very fertile.[31] Cornies insisted on the benefits, noting in 1843 that crop yields were more than twice as high on manured fields compared with unmanured.[32]

In selecting their crops, steppe farmers had to make decisions: sow crops, such as wheat that could realize high prices but were more susceptible to climatic fluctuations, or plant less profitable

crops that were more likely to survive the fluctuations, especially shortages of moisture. The Mennonites seem to have been more willing than other farmers to experiment. In 1837, Köppen recorded that they were starting to sow a red wheat from the nearby Crimean peninsula as well as the customary arnautka (a hard, durum, or pasta, wheat, sown in the spring). One attraction of the Crimean wheat was that it was in high demand in the nearby ports of Berdiansk and Mariupol', from where it was exported.[33] The red wheat, which was a winter wheat that was fall-sown, was drought resistant, but needed protection from frosts in the early spring to avoid winter killing. Thus, farmers learned to protect the young shoots by covering them with soil. Mennonite cultivation of the hard, red, winter wheat, which they called "*Krymka*", within the four-field rotation, developed in Molotschna in the 1860s and 1870s.[34]

Techniques for Cultivating the Soil

For farmers growing crops in the fertile soil, but semi-arid and drought-prone climate of the steppes, the crucial issue was accumulating and conserving moisture. Grain crops require moisture when they are growing in the spring, but this was also the part of the year when the steppes tend to suffer from droughts. To be successful, farmers needed techniques to retain water from snow and rain that fell at other times of year, especially if not unfailingly, the autumn and winter.

A number of steppe farmers and state-run experiment farms carried out trials in ploughing at various depths and at different times of the year to maximize the amount of moisture that collected in the soil. Some argued that the answer was to plough deeply – to a depth of six, eight or more inches – to allow moisture falling as precipitation to penetrate into the soil. The Mennonites of Molotschna were among other steppe farmers who practiced deep ploughing. Mennonite farmers were not the originators of deep ploughing for grain crops, but they had experience before 1837 of deep ploughing land for forestry plantations, which may have familiarized them with the advantages.[35] The Mennonites ploughed the fields for winter-sown crops in the late summer. They then harrowed the land to create a layer of loose, or friable, soil on the surface to assist in retaining the moisture in the soil, rather than letting it evaporate. Mennonite farmers and government agronomists believed that deep ploughing was an important contribution to their success.[36]

Black Fallow (schwarze Brache)

The central and signature technique practiced by the Mennonites of Molotschna was "black fallow" (*schwarze Brache*). They introduced it as part of their four-field rotation in 1837. Before 1837, some Mennonite farmers had planted grasses in the long-fallow fields, which they used as pasture for their livestock. Cornies strongly discouraged this practice, instructing farmers to prevent livestock from grazing in fallow fields. He ordered farmers to plough their fallow fields regularly over the summer to stop grass and weeds growing and leave the soil bare, hence the name "black fallow". Cornies recognized that any vegetation in the fallow fields would use up the moisture and nutrients that would be needed by the following season's crops. Keeping the fallow fields clear was very labour intensive. Over time the Mennonites devised implements to assist them.[37] Unlike some of the non-exclusively Mennonite practices described here, few other farmers in the steppe region practised "black fallow". However, it was used by farmers in other parts of Europe, and it is possible that Cornies learned about it from the agricultural literature.[38]

Philip Wiebe (Cornies's son-in-law who succeed him as head of the Agricultural Society after his death in 1848) stressed the value of black fallow: "Black fallow is the key factor of our steppe farming, without which a long time ago we would already have collapsed and grain farming in the Mennonite colonies would never have reached such a blossoming condition."[39] Petzholdt, who visited Molotschna in the drought year of 1855, wrote that the local Mennonites "firmly believe that if the fallow is worked [i.e. cultivated repeatedly] ... they never have to fear, even in the driest of years, a total crop failure and they see the reason for their conviction only in the fallow which has been provided with much moisture which has been retained."[40]

Shelterbelts of Trees

The Mennonite farmers planted "shelterbelts" of trees around their fields. This was important as strong winds blew across the land, drying out the soil, thus endangering crops, and, in drought conditions, whipping up the top soil in dust storms. Planting shelterbelts grew out of the Mennonites' obligation, imposed on them by the Russian authorities, to plant trees on their land, which was enforced by Cornies and supported by the Forestry Society. Cultivating trees in the steppe environment, where the native vegeta-

tion was predominantly grasses, was extremely difficult due to the soil, climate, and pests. Pioneers in steppe forestry, including the Mennonites, expended considerable efforts and suffered many failures before they worked out how to grow trees with some chance of success.[41] By the 1830s, according to Ukrainian historian K. V. Rudchenko, "the cultivation of forests to defend the land from the hot dry steppe winds…became a standard economic activity…for [the Mennonite] settlers." [42]

In 1842, Cornies reported that building on their success in planting trees in low-lying land and on slopes, they had become convinced of the possibility of growing trees on the high, treeless steppes, where plantings improved the air and protected top soil and crops from hot and cold winds. He also noted that planting a mixture of species, such as oaks and lindens, was more successful than single species, and provided better shelter from the wind.[43]

The Mennonites were not the only steppe farmers who realised the efficacy of strips of trees in sheltering land from the wind. A local farmer reported the value of the technique to a meeting of the Southern Russian Agricultural Society in Odessa in 1841.[44] The Mennonites' experiments were predated by at least one Russian landowner, Vasilii Lomikovskii, of Mirgorod district, Poltava province, in present-day northern Ukraine. Lomikovskii began planting trees on his estate in 1809, and published an account of his experiences, including planting shelterbelts, in 1837.[45] It was not until later in the nineteenth century, however, that the technique became more widespread and the subject of systematic research.[46]

The success of the Mennonites' practices for growing grain on the steppe, introduced and enforced under Cornies' leadership in Molotschna after 1837, can be gauged from data on the results. In the early 1850s, Wiebe compared average crop yields obtained in Molotschna before and after the new methods were introduced and compared the data from Molotschna with crop yields in the "Old Colony" at Chortitza, where the innovations were introduced later. The results, as Table 1 demonstrates, were quite striking.

Decade	Molotschna	Chortitza
1809-18	1: 6 $^{7}/_{10}$	1: 6 $^{1}/_{10}$
1819-28	1: 5 $^{2}/_{3}$	1: 4 $^{1}/_{4}$
1829-38	1: 9 $^{3}/_{7}$	1: 5 $^{3}/_{4}$
1839-48	1: 13 $^{2}/_{3}$	1: 6 $^{1}/_{2}$

Table 1: Average yields (seed to harvest ratios) on Mennonite Land[47]

Even taking into account that the land in Molotschna was more favourable for crops than in Chortitza, the increase in yields in the former after 1838 and the greater disparity between yields in the two locations thereafter is strong evidence for the new methods' success. Moreover, the averages conceal large year-by-year fluctuations, which lessened in Molotschna after 1837.[48] Petzholdt also noted the "excellent harvests" achieved by the Mennonites. But, their new methods were not infallible in extreme conditions. In 1854, "which was not a favourable year", Petzhold reported lower yields were harvested, and in 1855, he noted the destruction of the grain harvest by drought and grasshoppers.[49]

Over the following decades, and despite the set back in the mid-1850s, Mennonite farmers devoted more land to growing grain using the new methods. Visitors to Molotschna in the 1870s noted that some colonists had converted two-thirds of their land to arable.[50] It was also the quality of the grain they produced, in particular the hard, red, winter wheat (*Krymka*), that attracted attention. Henry Danby Seymour, a British politician who visited the Black Sea region, noted the high quality of the wheat produced by the "wealthy German colonies on the Moloshna [sic]" and exported from Berdiansk. He reported that it commanded a higher price than other types of wheat shipped from other ports in the region. According to Seymour, from the early 1850s large quantities of the wheat had been imported by English millers, who greatly appreciated its qualities.[51] The wheat attracted even more attention in the USA in the late nineteenth century after Mennonite migrants started growing it on the Great Plains (which has a similar climate and soils to the steppes). With support from the U.S. Department of Agriculture, under the name of "Turkey Red" it became one of the mainstays of wheat cultivation in the region in the first half of the twentieth century.[52] Mark Carleton, a USDA scientist who became acquainted with Mennonite farmers in Kansas and Nebraska during the drought of the 1890s, noted also the success of the farming practices they had brought with them from the steppes. He singled out their crop rotations, deep ploughing, and black fallow.[53]

Contexts and Motivations

Several explanations have been put forward for the Mennonites' success in agriculture. In an 1842 note, Cornies expressed no doubt about the reasons:

> The Molotschna Mennonite colony…is the most irrefutable and convincing proof of what constant and prudently directed labour can do for human prosperity. Industriousness and thrift have produced here...flourishing agriculture and trade, and...have laid strong foundations for the sufficiency, even wealth, of the settlers.

He added that the economic condition of the Molotschna Mennonites "stood out sharply" from other settlers in the region.[54] It is no coincidence that Haxthausen, whose similar views on the reasons for the Mennonites' success were quoted above, knew and was impressed by Cornies. Indeed, "Herr Kornies" was Haxthausen's host when he visited Molotschna in 1843.[55]

In explaining their success, Mennonite historian Harvey Dyck emphasized their innovative farming practices, the steppe environment, and motives of personal improvement:

> But all Mennonites...were equally dependent on the largesse of the steppe environment. Their past corporate success in mastering dry steppe cultivation through the innovations of deep ploughing, summer fallowing and the introduction of various field systems had won them accolades as Russia's premier agriculturalists. For them successful tillage was thus a source of livelihood as well as a status, self-worth and self-confidence.[56]

In a considered analysis of the factors behind the Mennonites' success in comparison with other groups in the population, John Staples weighed up the relative importance of: the impact of the "Great Drought 1832-4"; their religious beliefs and sense of identity; the amount of land they possessed and the system of land tenure; aid from the Russian state; and the role of Johann Cornies. His conclusion – that they drew on "their own traditions, experiences, and conceptions of justice and equity, as they...created commonwealths on the rolling steppes of the Molochna River Basin"[57] – leaves room for further discussion of this key issue.

Following various explanations that have been put forward for the Mennonites' success, this article will now focus on: a) Mennonite religious beliefs; b) environmental constraints and opportunities; c) market conditions and opportunities; d) the terms of Mennonite settlement on steppes; e) their obligation to the Russian government to be model farmers; f) leadership and entrepreneurialism.

Mennonite Religious Beliefs

Mennonite scholars have offered views on how their religious beliefs have shaped the attitudes of Mennonite farmers to the environment, agriculture, and work. For example, Cornelius Krahn, who was born in Chortitza and moved to the USA in 1937,[58] wrote the following about Mennonite agriculture in Russia:

> Whether our forefathers were guiding the plow to subdue the earth, or whether they were preaching the word of life as messengers of the Lord to subdue the hearts of men, they were His servants and messengers in as far as they were guided by His word and will.[59]

He continued that the:

> achievements of the Mennonites in the use of the 'plow' cannot be separated from their use of the Bible. Convictions derived from the Bible...were the source of inspiration and strength while guiding the plow and tilling the soil to make it productive.[60]

Krahn's use of the word "subdue", echoes Genesis 1:28, which has provoked much discussion of Judeo-Christian attitudes to "the environment". He also emphasized a primary objective of making the soil "productive", rather than caring for it. (Whether the Mennonite farmers on the steppes in the nineteenth century exhibited a concern to conserve the "environment" will be considered in the conclusion of this article.)

Alexander Klaus, a Volga German from Saratov province who worked for the Ministry of State Domains,[61] wrote a study of foreign colonies in Russia in 1869. He included an idealized passage on the importance of Mennonite religious beliefs and agricultural way of life (that belies the role of other branches of their economy):

> The quiet, religious character of the Mennonites, their flawless industriousness and diligence in their economy has afforded them the same freedom of religion in both our country and abroad. [...] On the basis of the biblical text 'in the sweat of your face' etc, the Mennonite can only be a *peasant*, neither medals, nor a uniform, nor in general any badge of *external* distinction will he take. Any craft or form of trade is subordinated to this basic principle; all of them are inseparably connected with *agriculture* as the chief calling of the Mennonite, and are dependent on the needs of an economy based on raising livestock and cultivating grain. Even the spiritual elders and preachers of the fraternity are...peasant-householders.[62]

Explicit or implicit in these writings is an emphasis on "toil". Bearing in mind traditional biblical and Protestant attitudes to work and discipline, it would be easy to attribute the Mennonite farmers' success to their work ethic. Haxthausen, who was a Roman Catholic, noted that the Mennonites considered agriculture to be a "religious duty".[63] Cornies emphasized the Mennonites' "industriousness and thrift"[64] and seems to have believed that they worked harder than their neighbours. He was aware that the farming practices he enforced, in particular constant cultivation of the fallow fields in the summer, demanded a lot of work. Characteristically, he justified this with reference to the admonition in Genesis "in the sweat of your face".[65] There is no doubt that the Mennonite farmers worked hard. German visitors such as Haxthausen and Petzholdt, perhaps drawing on their own prejudices, attributed this to what they believed to be their "Germanic" background. There is little hard evidence, however, that Mennonites worked harder than other farmers in the region, and suggestions that they did so provoked rebuttals from Russian commentators.[66]

Although the Mennonites' techniques required a lot of labour, the burden was lessened as the Russian authorities allowed them to live in relatively small settlements containing an average of around 120 inhabitants. As a result, their fields were often only eight miles or so away, and thus accessible for regular work. In contrast, their Orthodox, Slav peasant neighbours were required to live in larger settlements (to make it easier for the authorities to maintain control over them). On average, peasants' settlements were over four times the size of those of foreign colonists and, as a result, often twelve or more miles from their fields, making it harder for them to dedicate as much time to regular cultivation.[67]

Agriculture and the labour Mennonites invested in their land were central to their way of life and identity, both in the nineteenth century on the steppes and subsequently in other parts of the world. While their attitudes to farming and work provide contexts for the innovations in farming techniques they introduced on the steppes, this cannot alone explain their success.

Environmental Constraints and Opportunities

In their early decades on the steppes, rather than concerning themselves with protecting the "environment", Mennonite settlers were preoccupied with establishing and sustaining themselves in the difficult environmental conditions. As an example, in 1823-4

and between 1832-4, the Mennonites and their neighbours experienced almost total crop failures and lost many of their animals due to severe climatic conditions and pests.

In December 1824, Johann Cornies wrote to a merchant in Moscow:

> This year's harvest…is very poor. [...] Grasshoppers consumed virtually all the grass, and what remained was burned by scorching heat and ceaseless winds. We thought that great black clouds in the distance were rain, but when we drew nearer, we realized they were clouds of dust darkening the sky. [...] And as we experience such trials, God's word in the Bible acquires greater strength and light.[68]

The Russian authorities noted that Mennonite and other foreign colonists experienced crop failures in two successive years, leaving them with serious shortages of grain and fodder. In response, they distributed loans of cash and grain in 1825. Such was the Molotschna colony's plight, however, that in November 1826, the authorities granted them an extension for returning the loans.[69] Nevertheless, in August 1826, the redoubtable Cornies wrote to David Epp of Marienburg (today's Malbork) in the Vistula delta who was planning to move to Russia:

> It is unbelievable how quickly a barren steppe can be transformed into a cultivated region. I can already see that measures must be taken now...to plan and develop various pieces of land for our brethren in faith.[70]

On 6 November of the same year, in a letter to an official of the Russian Bible Society, Cornies drew spiritual sustenance from the Book of Job, concluding: "Yet God loves us even if He punishes us, and His love remains unchanged."[71]

Cornies also retained his faith in his God and his fellow Mennonites during the "great drought of 1832-1834."[72] In 1833, the Russian Empire, especially the steppe region, was hit by one of the worst droughts and harvest failures it had experienced. In June, as the extent of the crisis unfolded, the Ministry of Internal Affairs in St Petersburg collected reports from the affected region. The authorities noted that, right across the south, there was almost no spring. Instead, severe cold in March and April was followed immediately by heat waves and a total drought, accompanied by strong winds. There was insufficient moisture for crops to grow, indeed they were ruined, and there was little grass in the mead-

ows.[73] Molotschna was in one of the most badly hit areas. On 10 June 1833, Cornies wrote:

> From 10 July 1832 to 12 April 1833, we had absolutely no snow or rain here at all. This resulted in a complete crop failure. [...] Spring began with dry winds and dust clouds, and has continued in this way until almost the present time.[74]

Yet, a few weeks later on 17 July, after "great rain storms" had fallen, he wrote to Andrei Fadeev of the Guardianship Committee that, although "many in our community will suffer great setbacks from this total crop failure", "suffering will not be as acute as feared because reasoned thought can be applied to deal with these problems."[75]

Cornies' attitudes were similar to those of other Mennonites. Petzholdt, who visited in 1855 when the harvest was destroyed by drought and grasshoppers, wrote:

> The Mennonite lives quietly and content; he regards calamities as sent by God and he bears these patiently without grumbling. While I stayed there grasshoppers destroyed the crop but one heard not a word of complaint.[76]

Such phlegmatic attitudes were grounded not just in their faith, but also an awareness that the steppe environment also provided great opportunities to farmers who were able, and had the resources and support to work out ways to take advantage of them, and to weather difficult years. As the indigenous nomadic peoples knew from experience, the semi-arid climate and fertile soil were ideal for the growth of luxuriant grass to feed vast herds of livestock. In the early decades of the Molotschna colony, the Mennonites, including Cornies, raised large numbers of sheep.[77] The soil of much of the Molotschna colony was fertile, mostly the famed "black earth" (*chernozem*), which was very suitable for growing grain, as long as the farmers could conserve the scarce moisture they needed.[78] Several specialists, including Petzholdt, noted the particular importance of the fertile black earth to the Mennonites' success.[79]

In his recent book on the steppe, Barry Cunliffe asserted that "geography matters",[80] which indeed it does, but while the environmental constraints and opportunities shaped the techniques Mennonites developed by making use of the resources, they are not sufficient in themselves to explain the Mennonites' success.

Market Conditions and Opportunities

Beginning in the 1830s, the Mennonites' decision to dedicate increasing amounts of land and other resources to grain cultivation, even though it was perilous given the recurring droughts, was informed by market conditions and opportunities. The location of the Mennonite colonies allowed them to send their agricultural produce to nearby ports on the Sea of Azov, from where it was exported. The Mennonite farmers were thus able to participate in the burgeoning global trade of the nineteenth century. By the early 1840s, they had built their own grain stores in the new port of Berdiansk to facilitate exports.[81]

Developments in the global market had an important influence on steppe agriculture, including Mennonite farming. Over the mid-nineteenth century, the main product of steppe farming switched from sheep to grain. Improvements in shipping meant that Australian sheep farmers could send their high-quality wool from the other side of the world to Europe, where it provided stiff competition for wool from sheep on the steppes. Over the same period, several European states cut tariffs on grain imports. For example, in 1846 the British government abolished the corn laws, thus opening up the British domestic market, with its growing urban population, to foreign grain. Global market conditions, therefore, created opportunities for farmers on the steppes to export grain at substantial profits at precisely the time Mennonites had developed techniques that enabled them to grow grain successfully.[82]

The Terms of Mennonite Settlement on Steppes

Some Russian contemporaries argued strongly that the difference between prosperous Mennonite communities and their less affluent Slav neighbours was due to the privileges the Russian state granted the Mennonites when they moved to the Russian Empire. One of the strongest such arguments was made by Grigorii Eliseev in the journal *The Contemporary*, which published articles by radicals, including Populists such as Eliseev who placed their faith in the Russian people. Eliseev asserted that if the southern steppe had been settled by Ukrainian peasants with one-third of the privileges granted the Mennonites, then there was "no doubt" that it would be the "most flourishing part of the empire". Eliseev and others were challenging arguments by Germans, in particular Haxthausen and Petzholdt, that the Mennonites' success was due

to a "superior German" culture that emphasized industriousness and order.[83]

An examination of the terms of the Mennonite settlement on the steppes does suggest that part of the reason why they were able to take advantage of the opportunities afforded by the environmental and market conditions, and to make a success of their farming techniques was the favourable terms granted to them when they moved to the steppes. The Mennonites' privileges, which were similar to those granted to all foreign colonists, were collected in the *Privilegium* of 1800. The Mennonites were granted land allotments of 65 *desiatiny* (175 acres) per family, which they could pass on to their heirs in line with their existing inheritance practices. Villages were granted additional land for future generations (but not sufficient to prevent the emergence of many landless Mennonites). Settlers were granted exemption from taxation for ten years and, crucially for the Mennonites, freedom from military conscription as well as freedom to practice their religion. They were also given financial assistance to help set up their farms. Over the following decades, they were granted further support to improve their methods of farming, animal husbandry and forestry. The Mennonite settlers, like other foreign colonists, had rights of self-government under the supervision of the Guardianship Committee.[84]

The terms for the settlement of Mennonite and other foreign colonists were better in many respects than those for Orthodox, Slav, peasants in spite of a recommendation from the Governor General of New Russia that they be treated with the same care. State peasant settlers were granted 15 *desiatiny* of land for every male. Thus, households would have needed four males to approach the amount of land granted to foreign colonists. Furthermore, they received tax exemptions for only five years, not ten. However, they did receive cash loans, and grain for seed and food.[85]

The terms granted to the Mennonites were crucial for some of their techniques for growing grain. It was not practical for their Orthodox, peasant neighbours to emulate their "black fallow". It has already been noted that their fields located further from their villages, making it more time consuming to make the regular trips needed to cultivate them. Further, since the peasants had less land, they could not leave land unused, and clear of vegetation, as they needed to use their fallow fields as pasture for their livestock.[86] Compared with foreign colonists, the peasant settlers had far less incentive to plant trees on their land, since they had less security of tenure, and therefore could lose it after they had expended the considerable efforts needed to do so.[87] In addition, the support for

agricultural improvements by the Guardianship Committee for foreign colonists, for example the sheep, forestry, and agricultural societies, was far greater than that provided for peasant settlers. Thus, arguments that the Mennonites' economic success cannot be explained by "greater state aid"[88] are not sustainable. In their analysis of Mennonite success relative to their peasant neighbours, Judith Pallot and Denis Shaw concluded: "More land, capital, and labour would have been needed on ordinary peasant farms if the Mennonites' methods were to be imitated."[89]

The terms of the Mennonites' settlement, therefore, allowed them to implement the agricultural techniques that were successful, but the advantageous terms themselves can be only part of the explanation for their success.

The Mennonites' Obligation to be Model Farmers

In return for the favourable terms of settlement, the *Privilegium* that codified the terms also noted that the Mennonites' "excellent industry and morality may…be held up as a model." [90] In other words, the Mennonites were expected to serve as models for agricultural and economic development for the surrounding population. This obligation proved to be a weapon for the Russian authorities and the Mennonite leaders to impose farming methods, including the new techniques, on the community, and to insist that all worked hard, on pain of the favourable treatment being withdrawn.

The Mennonite leaders took their obligation to be model farmers very seriously and were aware that their privileges were conditional on living up to the Russian government's expectations. Cornies reiterated this in his letters. For example, in 1826 he wrote to David Epp, who was considering moving from Prussia to the Russian Empire:

> The [Russian] Crown does not want simply to attract foreigners into the country and will only be satisfied with good, upright, economic managers, useful to the state. I was told the following at the Ministry in St Petersburg: "If you do not work industriously, as you promised and for which you were granted the *Privilegium*, you are in danger of losing your special privileges."[91]

The Russian authorities did not allow Cornies or the Mennonite settlers to forget this. In 1831, Andrei Fadeev of the Guardianship Committee sent Cornies a directive to establish local societies to

promote forestry and other branches of the rural economy. The directive opened, "The Mennonite settlements in New Russia attract more government attention than do all other foreign settlements. Morality and a clear conscience should motivate those Mennonites to prove they are the best inhabitants of this region."[92] Fadeev's directive summarized the Mennonites' privileges, their achievements thus far, but noted also that they could:

> accomplish still more by making special efforts to achieve the highest possible level of perfection. This would justify the government's expectations in the fullest measure, and demonstrate that their significant advantages over other settlers have not been given in vain.[93]

Further, Fadeev reminded them that meeting their obligations "will assist Mennonites in maintaining their privileges on a firm, enduring foundation."[94] The Mennonites lived up to these expectations. In 1853, Baron Rosen, the head of the Guardianship Committee, wrote, "The remarkable fact that the Mennonites...farm the land more successfully than other settlers prompts me to bring these farmers to the attention of others as an example."[95]

The requirement to act as model farmers in return for their privileges was a powerful tool to enforce conformity, and adherence to the farming practices, in the hands of the authorities and Cornies. Cornies regularly threatened to evict Mennonite farmers who disobeyed his orders, and on at least one occasion, went through with the threat.[96]

Leadership and Entrepreneurialism

Central to the development and enforcement of the new farming techniques were leadership and a spirit of enterprise in the Mennonite colonies. The Russian authorities set up an administrative system that created a balance between top-direction and local participation and initiative. The Mennonites governed their own affairs, but were subordinate to the Guardianship Committee, that provided overall direction. This allowed Mennonite elites to be involved in the administrative system and to achieve personal advancement through implementing Russian objectives.[97] The key figure, of course, was the controversial Cornies, who assumed considerable power in the Molotschna colony. Cornies invariably impressed visitors. Petzholdt heaped praise on him. He noted:

> one attribute [which] was of great importance to his being highly successful in almost all undertakings [was] the fact that he was constantly formulating plans years in advance and making necessary preparations. Since he saw potential difficulties well ahead, he disposed of them and only then after his plans had matured, he assumed action of a broad front which made it appear that his endeavours were accompanied by a particularly lucky star.[98]

He ruled in an autocratic manner, backed up by state power, and served the interests of the Russian state at least as much as those of his community. He alienated some of his fellow Mennonites. Nevertheless, historians have generally been favourable to him. Under his leadership, and in subsequent decades, the Mennonite community as a whole, if not all of its members, prospered not least as a result of the agricultural innovations he introduced and enforced.[99]

Cornies could not have been successful without a spirit of entrepreneurialism among the Mennonites,[100] a willingness among some of them to identify opportunities for development, to pursue new paths, and to do things differently from their neighbours. In 1843, Cornies asserted that, in contrast to the past when they had relied on luck, their new techniques were based on experience and knowledge.[101] This may have been due to their education and literacy, access to libraries with books on agriculture, forestry, and economics as well as religion.[102] They also had a heritage of migration and experience of living and working in different conditions. The environmental challenges they encountered on the steppes, where they needed to conserve scarce moisture, were the opposite of the excess of water that needed to be drained in the Vistula delta, from where they or their parents had moved a few decades earlier.[103] In their new homes on the steppe, moreover, they lived among a diverse population, including other agricultural settlers as well as pastoral peoples, who they could compare themselves with and draw conclusions. Indeed, in March 1833, Cornies wrote, "It is very interesting to find so many peoples living closely together. […] As they go about their business, we observe varied customs, languages, costumes, and ways of life."[104]

Entrepreneurialism seems to have driven Mennonites just as much as their faith. In an insightful discussion of Mennonites in the Russian Empire in the late nineteenth and early twentieth centuries, James Urry noted the limited extent to which they seem to have articulated the contradictions between their religious belief and "aggressive involvement with a wider world of business, profit

and capitalism", and the "gross inequalities of wealth" that this generated in their own communities.[105]

Conclusion

Ultimately, and drawing on all the factors discussed above, it was the leadership and entrepreneurial spirit that explain why the Mennonites of Molotschna were able to develop, implement, and make a success of their farming techniques, overcome the environmental constraints, in particular the semi-arid climate, and take advantage of the opportunities provided by the fertile soil, market conditions, and their favourable terms of settlement. Their faith, as is suggested in some of Cornies' letters, moreover, provided a form of emotional insurance in difficult times.

At the start of this article I quoted Loewen's argument on the "dialectical relationship" between Mennonites and the land. The land, or more broadly the environment of the steppes, certainly had an affect on the farmers of Molotschna, providing both constraints and opportunities, but the Mennonites also "left an imprint on the land." Were the farmers on the steppe in the nineteenth century motivated by any concern to exercise good stewardship over the land? Or would it be ahistorical to ascribe such attitudes to Mennonite farmers in the nineteenth century? A rare example, before the emergence of the modern environmental movement in the 1960s, can be found in a statement by Joseph Winfield Fretz (who was not of Dutch Russian Mennonite origins):[106]

> AGRICULTURE is the chief occupation of the men of the Bible. God first created the earth, then made man out of the earth, and finally arranged that he care for and live off its fruits. There is no doubt that the Scriptures teach that land is sacred, and that possession of it entails responsibilities and obligations.
>
> While every man is entitled to own property, no one is permitted to abuse or impoverish it or even to own too much of it.
>
> Farmers are God's modern husbandmen and they must see that the fertility of the soil is preserved for their children and their children's children.

However, Fretz's attention to Mennonite responsibilities towards the land was written in the context of U.S. government support for soil conservation measures during and after the "dust bowl" of the 1930s, rather than a long-standing religious motivation.[107]

Mennonites sources contemporary to the subject of this article and from the Russian Empire reveal little such concern to husband the land. Cornies was motivated by productivity and profit. In 1843, he asserted that in introducing improvements in the ways they farmed the land, "all the efforts of the colonists were directed towards extracting from this land the largest profit by increasing its productivity."[108] Their new farming techniques, which were designed for these purposes, had mixed results for the land. Crop rotations are both productive and assist in soil conservation. Grain crops, however, exhausted the soil, which under intensive cultivation required fertilizer, which they applied in the form of manure. Deep ploughing, if not carried out at appropriate times, can assist evaporation, hence the need to harrow the fields to create a friable layer of soil to reduce it. Further, deep ploughing can be damaging unless top soil is sufficiently deep, otherwise less fertile subsoil is brought to the surface. In recent decades, as a result of much subsequent experience and research not available to the Molotschna Mennonites, farmers and agronomists have recognized the economic and environmental advantages of "no-till farming", especially as part of crop rotations.[109] Back in the mid-nineteenth century, agronomists, including Petzholdt, questioned the Mennonites' signature technique of "black fallow", arguing that it contributed to soil exhaustion.[110] Shelterbelts of trees continue to have their advocates, who argue that the loss of land to trees is compensated for by increased and more stable crop yields on sheltered land.[111]

Mennonite grain farming, moreover, was part of the wholesale plough up of the steppes from the mid-nineteenth century that, in a few decades, obliterated all but a few oases of the former steppe ecosystem. The extensive sheep farming that had prevailed earlier was also damaging to the environment, especially on thinner soils near the Black Sea coast, where areas were badly damaged by the resulting soil erosion.[112] Thus, productivity, profit, and sustaining their families and communities in the conditions of the steppe environment seem to have been the driving motivations behind the Mennonites' farming practices and success. This is not to condemn them for not showing due care for the environment – a concept that developed in its current understanding later – but to locate Mennonite farmers on the steppe in the first half of the nineteenth century firmly in the historical context of the location and the time they were living in.

Notes

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[2] I have preferred German spellings for the colonies of Molotschna (Molochna in Ukrainian and Russian) and Chortitza (Khortytsia in Ukrainian, Khortitsa in Russian), but have used the Slavic spelling for the Molochna River. New Russia (Novorossiia) was the contemporary name for southern Ukraine.

[3] Royden Loewen, "The Quiet on the Land: The Environment in Mennonite Historiography," *Journal of Mennonite Studies* [hereafter *JMS*], 23 (2005), 151-164; quotation from 161.

[4] Harvey L. Dyck and John R. Staples (ed.), *Transformation on the Southern Ukrainian Steppe: Letters and Papers of Johann Cornies*, Vol.1: 1812-1835 (Toronto: Toronto University Press, 2015).

[5] See J. Staples, "The Mennonite Commonwealth Paradigm and the Dnepropetrovsk School of Ukrainian Mennonite Historiography," in *Voprosy Germanskoi istorii* (Dnepropetrovsk: Porogi, 2007), 58-69.

[6] August von Haxthausen, *The Russian Empire: Its People, Institutions and Resources*, 2 vols, trans. Robert Farie (London: Chapman and Hall, 1856), vol.2, 42.

[7] August Freiherrn von Haxthausen, *Studien uber die innern Zustande, das Volksleben und insbesondere die landlichen Einrichtungen Russlands*, 3 vols (Hannover: In der Hahn'schen Hofbuchhandlung, 1847-1852), vol.2, 171.

[8] See Martin Malia, *Russia under Western Eyes: From the Bronze Horseman to the Lenin Mausoleum* (Cambridge, MA: Harvard University Press, 2000), 137-9.

[9] See Heinrich Kaak, "Petzholdt, Georg Paul Alexander," in *Sächsische Biografie*, hrsg. vom Institut für Sächsische Geschichte und Volkskunde e.V., bearb. von Martina Schattkowsky, Online-Ausgabe: http://www.isgv.de /saebi/.(accessed 16.01.2017).

[10] Alexander Petzholdt, *Reise im westlichen und südlichen europäischen Russland im Jahre 1855* (Leipzig: Hermann Fries, 1864), 184. http://chort.square7.ch/Buch/Petz.pdf (accessed 17.01.2017).

[11] Petzholdt, *Reise*, 146-7.

[12] Ibid., 165.

[13] Ibid., 181,

[14] See, for example, G. Eliseev, "Vnutrennee obozreneie," *Sovremennik* 3 (1865): 337-79. (The article is a review of Petzholdt's book.)

[15] Derzhavnyi arkhiv Odes'koi oblasti, Odessa, Ukraine (hereafter DAOO) [State Archive of Odessa Region], fond (f.) 1, opis' (op.) 248, 1856, delo (d.) 1580, listy (ll.) 22ob.-25ob., 124ob.-125, 127.

[16] For other examples, see Nikolai Gersevanov, "Nechto o khoziaistve Molochanskikh kolonii," *Zapiski Imperatorskogo Obshchestva Sel'skogo Khoziaist-*

va Iuzhnoi Rossii [hereafter *ZIOSKhIuR*] 5 (1847): 111-3; Sergei Dobrovol'skii, "Obzor khoziaistva Menonitov Tavricheskoi gubernii," *ZIOSKhIuR* 8 (1849): 487-502; N. K. Kalageorgi and B. M. Borisov, *Ekskursiia na reku Molochnuiu: opyt sel'skokhoziaistvennogo i ekonomicheskogo issledovaniia iuzhnorusskikh khoziaistv* (St Petersburg [hereafter Spb]: tip. V. F. Demakova, 1878); V. Postnikov, "Molochanskie i Khoritskie Nemetskie kolonii: Khoziaistvenno-statisticheskii ocherk," *Sel'skoe khoziaistvo i lesovodstvo* [hereafter *SKhiL*]: 139 (1882), 1st pagn, 79-99, 221-40; 140 (1882), 1st pagn, 35-49.

17 See, for example, David G. Rempel, "Mennonite Agriculture and Model Farming as Issues of Economic Study and Political Controversy, 1837-1917," unpublished manuscript; John R. Staples, *Cross-Cultural Encounters on the Ukrainian Steppe: Settling the Molochna Basin, 1783-1861* (Toronto: University of Toronto Press, 2003), 179-86; James Urry, *None but Saints: The Transformation of Mennonite Life in Russia, 1789-1889* (Winnipeg: Hyperion Press, 1989), 125; Maryna V. Bielikova, "Menonits'ki koloni Ukrainy (1789-1917 rr.)," Avtoreferat disertatsii, Zaporiz'kyi Natsional'nyi Universtytet, 2005, 5.

18 See Urry, *None but Saints*, 63-74; Staples, *Cross-Cultural Encounters*, 18-44; Roger P. Bartlett, *Human Capital: The Settlement of Foreigners in Russia, 1762 1804* (Cambridge: Cambridge University Press, 1979).

19 See Willard Sunderland, *Taming the Wild Field: Colonization and Empire on the Russian Steppe* (Ithaca, NY: Cornell University Press, 2004); Staples, *Cross-Cultural Encounters*; Leonard Friesen, *Rural Revolutions in Southern Ukraine: Peasants, Nobles, and Colonists, 1774-1905* (Cambridge, MA: Harvard Series in Ukrainian Studies, 2009); E. I. Druzhinina, *Severnoe Prichernomor'e v 1775-1800 gg.* (Moscow: Nauka, 1959); id., *Iuzhnaia Ukraina v 1800 1825 gg.* (Moscow: Nauka, 1970); id., *Iuzhnaia Ukraina v period krizisa feodalizma 1825-1860 gg.* (Moscow: Nauka, 1981).

20 For a "big history" approach, see Barry Cunliffe, *By Steppe, Desert, and Ocean: The Birth of Eurasia* (Oxford: Oxford University Press, 2015). On steppe ecology, see A. A. Chibilev, *Stepi Severnoi Evrazii: ekologo-geograficheskii ocherk i bibliografiia* (Ekaterinburg: UrO RAN, 1998).

21 For a discussion of the environmental challenges and attempts to overcome them, see David Moon, *The Plough that Broke the Steppes: Agriculture and Environment on Russia's Grasslands, 1700-1914* (Oxford: Oxford University Press, 2013).

22 See Urry, *None but Saints*, 95-104, 122-6.

23 On the Guardianship Committee, see Staples, *Cross-Cultural Encounters*, 24, 114-21.

24 On the history of Russian agricultural research institutions, see O. Iu. Elina, *Ot tsarskikh sadov do sovetskikh polei: istoriia sel'sko-khoziaistvennykh opytnykh uchrezhdenii XVIII-20-e gody XX v.*, 2 vols (Moscow: Russian Academy of Sciences, 2008).

25 Moon, *Plough*, 19-20, 158-62, 251-57.

26 G.L. Gavel', "Sravnitel'nye ocherki sel'skogo khoziaistva i agrarnogo polozheniia poselian v nekotorykh mestakh Rossii," *SkhiL* 117 (1874): 67; Staples, *Cross-Cultural Encounters*, 121.

27 Dobrovol'skii, "Obzor," 491; Petzholdt, *Reise*, 160-1.

[28] Rossiiskii Gosudarstvennyi Istoricheskii arkhiv, St Petersburg, Russia (hereafter RGIA) [Russian State Historical Archive], f.383, op.29, 1837-8, d.609, l.38ob.
[29] Postnikov, "Molochanskie i Khoritskie Nemetskie kolonii," 36.
[30] See Moon, *Plough*, 250-7.
[31] Gersevanov, "Nechto o khoziaistve Molochanskikh kolonii," 111-12; Petzholdt, Reise, 165. On contemporary debates about soil exhaustion and fertilizers, see Moon, *Plough*, 158-62.
[32] I. Kornis, "O sostoianii khoziaistva v Molochanskikh Menonistikh koloniiakh v 1842 g.," *Zhurnal Ministerstva Gosudarstvennikh Imushchestv* [hereafter *ZhMGI*] 8 (1843): 2nd pagn, 67.
[33] RGIA, 383, op.29, 1837-8, d.609, ll.37ob.-8.
[34] David Moon, "In the Russians' Steppes: The Introduction of Russian Wheat on the Great Plains of the United States of America," *Journal of Global History* 3 (2008): 216-18.
[35] Dyck and Staples, *Transformation*, 247, 251, 301, 319, 400-1.
[36] See K. Tsin, "Otchet ob uspekakh sel'skogo khoziaistva v mennonitskom kolonial'nom okruge za 1843," *ZIOSKhIuR* 2 (1844): 11; Dobrovol'skii, "Obzor," 495-8; Filipp Vibe [Philip Wiebe], "Khlebopashestvo Menonitov iuzhnoi Rossii," *ZIOSKhIuR* 4 (1853) [1st published in *Unterhaltungsblatt für deutsche Ansiedler im Südlichen Russland*, 1852]: 154-5.
[37] Staples, *Cross-Cultural Encounters*, 121-2; Gavel, "Sravnitel'nye ocherki," 67; Petzholdt, *Reise*, 161-3.
[38] Moon, *Plough*, 264-8.
[39] Vibe, "Khlebopashestvo," 158-9.
[40] Petzholdt, *Reise*, 161-2.
[41] Petzholdt, *Reise*, 168-81. See also G.N. Vysotskii, "Stepnoe lesorazvedenie," *Polnaia entsiklopediia russkogo sel'skogo khoziaistva i soprikasaiushchikhsia s nimi nauk*, 12 vols (Spb: Devrien, 1900-1912), vol.9 (1905), cols 443-99. Vysotskii commented on the work of Mennonites and other foreign colonists. ibid., cols 445-6.
[42] K. V. Rudchenko, "Rol' menonitiv v intensivnoumu rozvitku stepovogo lisorosvedennnia u pershii polovyni XIX stolittia," in *Molochna – 2004: Menonity i ikh susidy (1804-2004)* (Zaporizhzhia: Tandem U, 2004), 87. See also N. V. Krylov, "Molochanskie mennonity i lesorazvedenie v zaporozhskom priazov'e," in *Rozvytok heohrafichnoi dumky na pivdni Ukrainy: problemy i poshuky* (Melitopol': Melitopol, 2006), 174-79, http://chort.square7.ch/Buch/Krylow.pdf (accessed 23.11.2016).
[43] I. Kornis, "O sostoianii khoziaistva v Molochanskikh Menonistikh koloniiakh v 1842 g.," *ZhMGI*, 8 (1843), 2nd pagn, 70-1.
[44] I. Isnar, "Ob uluchshenii stepei poludennoi Rossii," *ZhMGI* 6 (1842): 3rd pagn, 596-613.
[45] Lomikovskii, *Razvedenie lesa v sel'tse Trudoliubov* (Spb: tip. Departamenta Vneshnei Torgovli, 1837).
[46] See Moon, *Plough*, 198-202.
[47] F. Vibe, "Khlebopashestvo Menonitov iuzhnoi Rossii," *ZIOSKhIuR* 4 (1853): 159.
[48] See also Staples, *Cross-Cultural Encounters*, 123.
[49] Petzholdt, *Reise*, 165-6.
[50] Kalageorgi and Borisov, *Ekskursiia*, 102.

[51] Henry Danby Seymour, *Russia on the Black Sea and Sea of Azof: being a narrative of travels in the Crimea and bordering provinces* (London: John Murray, 1855), 315, 319-20.
[52] See Moon, "In the Russians' Steppes." See also David G. Rempel, "The Mennonite Colonies in New Russia: A Study of their Settlement and Economic Development from 1789 to 1914," Ph.D. thesis, Stanford University, 1933, 247.
[53] Mark Alfred Carleton, "Successful Wheat Growing in Semiarid Districts," in *Yearbook of the United States Department of Agriculture 1900* (Washington, DC: Govt Printing Office, 1901), 539–41.
[54] Kornis, "O sostoianii khoziaistva ... v 1842 g.," 64-5.
[55] Haxthausen, *Studien*, vol.2, 181-6.
[56] Harvey L. Dyck, "Mid Point Between Revolutions: the Russian Mennonite World of 1911," *Mennonite Life* 36, no. 1 (1981): 12.
[57] Staples, *Cross-Cultural Encounters*, 179-86.
[58] Rachel Waltner Goossen, "Krahn, Cornelius (1902-1990)," in *Global Anabaptist Mennonite Encyclopedia Online* [hereafter *GAMEO*]. 1990, http://gameo.org/index.php?title=Krahn,_Cornelius_(1902-1990)&oldid=122539. (Accessed 16.01.2017).
[59] "Bible and Plow: An Editorial," *Mennonite Life* 10, no. 1 (1955): 3.
[60] Krahn, "Agriculture among the Mennonites of Russia," 14.
[61] On Klaus, see James Long, *The German-Russians: A Bibliography* (Santa Barbara, CA: American Bibliographical Center—Clio Press. 1978), 21.
[62] A. Klaus, *Nashi Kolonii: opyty i materialy po istorii i statistike inostrannoi kolonizatsii v Rossii* (Spb: tip. V.V. Nusval'ta, 1869), 235.
[63] Haxthausen, *The Russian Empire*, vol.1, 423, 428.
[64] Kornis, "O sostoianii khoziaistva ... v 1842 g.", 64-5.
[65] See Staples, *Cross-Cultural Encounters*, 122.
[66] See Roger P. Bartlett, "Colonists, Gastarbeiter, and the Problems of Agriculture in Post-Emancipation Russia," *Slavonic and East European Review* 60, no. 4 (1982): 547-571.
[67] Gersevanov, "Nechto o khoziaistve Molochanskikh kolonii," 112. For data on settlement size and distance to fields, see Friesen, *Rural Revolutions*, 58-9. For more striking contrasts in settlement size in one district, see Staples, *Cross-Cultural Encounters*, 31.
[68] Dyck and Staples, *Transformation*, 20.
[69] DAOO, f.6, op. 1, 1824, d.1774, ll.1-7ob., 32-35ob., 51-62, 85.
[70] Dyck and Staples, *Transformation*, 77.
[71] Ibid., 92-3.
[72] See Staples, *Cross-Cultural Encounters*, 87-106.
[73] RGIA, f.1287, op.2, 1833, d.146, l.230-ob.
[74] Dyck and Staples, *Transformation*, 327
[75] Ibid., 330-31. See also James Urry, "Immigration and Famine in Russia, 1833: Two letters of Johann Cornies," *Mennonite Life* 46, no. 3 (1991): 18-20.
[76] Petzholdt, *Reise*, 183.
[77] See Friesen, *Rural Revolutions*, 80-4, 93-5.
[78] On the soil types and average precipitation in the Molochna basin, see Staples, *Cross-Cultural Encounters*, xviii-xx, 3-10.
[79] Petzholdt, *Reise*, 163-4.
[80] Cunliffe, *By Steppe*, 32-3.

[81] Kornis, "O sostoianii khoziaistva ... v 1842 g.," 66.
[82] See Friesen, *Rural Revolutions*, 66-73, 100-2, 170-3; Staples, *Cross-Cultural Encounters*, 72-3, 122-3.
[83] Eliseev, "Vnutrennee obozreneie," 367-8 and passim.
[84] James Urry, *Mennonites, Politics, and Peoplehood: Europe – Russia – Canada, 1525 to 1980* (Winnipeg: University of Manitoba Press, 2006), 85-92; Staples, *Cross-Cultural Encounters*, 41-4, 181-2.
[85] See Druzhinina, *Iuzhnaia Ukraina*, 93; Staples, *Cross-Cultural Encounters*, 30-1.
[86] A. Chelintsev, "Obzor russkoi literatury po sel'skomu khoziaistvu," *SKhiL* 228 (1908): 157-8.
[87] For a limited attempt to address this, see Moon, *Plough*, 184-5.
[88] See, for example, Staples, *Cross-Cultural Encounters*, 182.
[89] Judith Pallot and Denis J. B. Shaw, *Landscape and Settlement in Romanov Russia, 1613-1917* (Oxford: Clarendon, 1990), 111.
[90] Urry, *Mennonites,* 91-2.
[91] Dyck and Staples, *Transformation*, 105-6.
[92] Ibid., 227.
[93] Ibid.
[94] Ibid., 228.
[95] Vibe "Khlebopashestvo", 153 (introduction by Rosen).
[96] Staples, *Cross-Cultural Encounters*, 120.
[97] There was a long-standing practice in the Russian Empire of co-opting elites of national minorities in return for imperial support for their status. Marc Raeff, *Political Ideas and Institutions in Imperial Russia* (Boulder, CO: Westview Press, 1994), 134-7.
[98] Petzholdt, *Reise*, 191-2.
[99] On Cornies, see: "Agronomist Gavel's Biography of Johann Cornies (1789-1848)," *JMS* 2 (1984): 29-41 [translation of obituary published in Russia in 1848]; Harvey L. Dyck, "Russian servitor and Mennonite Hero: Light and Shadow in Images of Johann Cornies," *JMS* 2 (1984): 9-28; Staples, *Cross-Cultural Encounters*, 107-43; Urry, *None but Saints*, 119-30; N. V. Venger, *Mennonitskoe predprinimatel'stvo v usloviiakh modernizatsii Iuga Rossii: mezhdu kongregatsiei, klanom i rossiiskim obshchestvom (1789-1920)* (Dnepropetrovsk: Izd-vo Dnepropetrovskogo natsionnal'nogo universiteta, 2009), 206-15.
[100] See Venger, *Mennonitskoe predprinimatel'stvo*, 476-95.
[101] I. Kornis, "O sostoianii khoziaistva v Molochanskikh Menonistskikh koloniiakh v 1843 g.," *ZhMGI* 11 (1844): 2nd pagn, 129.
[102] Kornis, "O sostoianii khoziaistva .... v 1842 g.," 77-8.
[103] See Hans Werner, "Mennonites and the Vistula: The Land and the Water," *Preservings* 33 (2013): 10-16.
[104] Dyck and Staples, *Transformation*, 318.
[105] James Urry, "Through the Eye of a Needle: Wealth and the Mennonite Experience in Imperial Russia," *JMS* 3 (1985):.28-9. Sociologist E. K. Francis noted a similar contradiction among Mennonites migrants from the Russian Empire to Canada in the late nineteenth century, *In Search of Utopia: The Mennonites of Manitoba* (Altona, MB: D. W. Friesen, 1955), 110-11.
[106] Fretz came from Pennsylvania, where the Mennonites' forebears had migrated from Europe in the seventeenth and eighteenth centuries. On Fretz,

see Sam Steiner, "Fretz, Joseph Winfield (1910-2005)," *GAMEO*, http://gameo.org/index.php?title=Fretz,_Joseph_Winfield_(1910-2005)&oldid=143570. (Accessed 16.01.2017).

[107] J. Winfield Fretz, "Farming: Our Heritage," *Mennonite Life* 4, no. 2 (1949): 2. See also Douglas Helms, "Conserving the Plains: The Soil Conservation Service in the Great Plains," *Agricultural History* 64, no. 2 (1990): 58-73.

[108] Kornis, "O sostoianii khoziaistva .... v 1842 g.," 67.

[109] Rolf Derpsch et al, "Current status of adoption of no-till farming in the world and some of its main benefits," *International Journal of Agricultural and Biological Engineering* 3, no. 1 (2010): 1-25.

[110] Petzholdt, *Reise*, 164; I. Palimpsestov, "O chernom pare," *ZIOSKhIuR* (1855): 207-14.

[111] See, for example, James R. Brandle et al (eds.), *Windbreak Technology* (Amsterdam: Elsevier Science Publishers, 1988).

[112] See David Moon, "Steppe by Steppe: Exploring Environmental Change in Southern Ukraine," *Global Environment* 9 (2016): 414-39; Deák, B., Tóthmérész, B., Valkó, O. et al., "Cultural monuments and nature conservation: a review of the role of kurgans in the conservation and restoration of steppe vegetation," *Biodiversity and Conservation* 25 (2016): 2474-5.