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# ‘The Land is Spoiled By Water’: Cossack Colonisation in the North Caucasus

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## SUMMARY

A frontier environmental history of Cossack settlers in the North Caucasus reveals some of the weaknesses of the Russian imperial mission. Cossacks transformed the landscape of settlement through deforestation and canalisation; the resulting floods and disease regime put severe limits on their ability to be economic colonisers or cultural assimilators. In many respects, the land proved to be a tougher enemy than the mountain people whom they were sent to conquer.

‘The famous, glorious, rapid Terek broke through the mountains and forest.  
Break through this bank and carry me with you.’

Terek Cossack song

‘A person is spoiled by another person, but the land is spoiled by water.’

North Caucasus mountaineer saying

Frontier history is incomplete without an ecological component. Some of the most imaginative and influential histories of American frontiers in the last few decades have been environmental histories; one could go so far as to say that the American frontier is the birthplace of the subdiscipline.<sup>1</sup> This is because of the American contribution to frontier historiography: the environment emerges from the background and plays a leading role in the history of frontiers, where settlers try to construct new communities in unfamiliar ecological contexts. How settlers are transformed by and how they transform their landscapes are integral parts of their struggles and opportunities.

An environmental history of settlement in the North Caucasus is particularly inviting; there are few regions in the world with such extremes and diversity of nature, including the numerous microclimates of the mountains and the foothills, the cycles of flooding and drought in the valleys, and the contrast of the

mountains with the steppe – near desert along the Caspian Sea – and the swampy Terek lowlands. Here the camel butts heads with the ox, the buffalo with the mountain goat.

This article will focus on the environmental consequences of the settlement of Cossacks, who came to be known as Terek Cossacks, in this region in the eighteenth and nineteenth centuries. This was a very different environment from the Russian and Ukrainian heartlands from which many Terek Cossacks came, and their struggle to adapt was a major part of their story. The colonisation of the North Caucasus was not only conditioned by the environment; sometimes the environment played a primary role and determined the success or failure of colonisation. And the Cossacks who settled in the North Caucasus altered that environment. At the least, this environmental history gives nuance to the myth of Cossack as pathfinder, forging into uncharted territory and mastering new lands for the tsar. In the North Caucasus, the lands rather mastered the Cossacks and put serious limitations on their colonial mission. Cossacks spent plenty of time fighting Chechens and others in the North Caucasus and helped the state integrate this region into the Russia empire. But they also spent enough time fighting floods and disease that they never became economic colonisers or any type of assimilationist force.<sup>2</sup>

The Terek Cossacks settled mostly in the Terek River valley, a relatively narrow strip of more or less wooded land between the steppe and the mountains. An important ecological divide separated Cossacks of the Terek-Kumyk lowlands, to the east of Mozdok (which I will call the lower Terek region) and the Cossacks of the Stavropol' plateau and the heights of Central Ciscaucasia (the upper Terek, upper Kuma region). The Terek-Kizliar and Terek-Semeinoe hosts and the Greben regiments lived in the former; the Mountain, Volga, and Vladikavkaz regiments lived in the latter; while the Sunzha and Mozdok regiments straddled the two zones.<sup>3</sup>

The land of the lower Terek was, in general, wetter, saltier, and sandier; swamps flooded the Terek delta and sands blew between the Terek and the Kuma. Along the Caspian to the north of Kizliar, salt deposits dotted the steppe. As one observer described them in the mid-nineteenth century, 'deep pits, pasted all over with salt, scattered over the steppe like empty bowls.' The land here was less suitable for agriculture, although in some areas in the steppe, with irrigation, a fair grain crop could be grown. But the lower Terek was known more for its horticulture (grapes and other fruits) and rice paddies than for its grain.<sup>4</sup> In general, the further to the west, the less waterlogged and the better the land along the Terek was; the swamiest lands belonged to the Terek-Kizliar and the Terek-Semeinoe hosts. The steppe land also improved, from near desert along the Caspian Sea to fertile *chernozem* to the west of Mozdok.<sup>5</sup>

Besides the varying suitability of the soil for agriculture, the three main ecological challenges that Terek Cossacks faced involved deforestation, flooding, and the sickness which these processes helped to create.

## DEFORESTATION

Thanks to Tolstoi's story, 'The Wood Felling', and to the concentration on the military history of the North Caucasus, the dominant impression is that the Russian army deforested the region to eliminate the woodland cover of hostile tribes and by hacking out ever more military roads. Indeed, the army was incredibly destructive in places, especially in Chechnia (see below). But deforestation was a more complicated process, fuelled mostly by the insatiable need for lumber and firewood in the villages sprouting up in, and at the edge of, the steppe. Wherever Cossacks (and peasants) settled in the North Caucasus, the narrow bands of accessible forest along the river valleys soon receded and in many spots disappeared. The demand for wood was so great that it was shipped in from the interior of Russia at great cost and obtained locally in a high-volume trade with the people of the mountains.

There is abundant anecdotal evidence concerning the deforestation – and the attendant environmental affects – caused by colonisation. The difficulty is in establishing the timing and the extent of the destruction. Travel accounts and other anecdotal evidence can be misrepresentative, pointing to a clearing here or a forest there as a general landscape. Forest conservation measures provide a different type of evidence, but we do not always know if these were put into effect in anticipation or as a result of deforestation. If the latter, they do not necessarily help determine the timing. Soviet spore and pollen analyses are very useful in reconstructing historic forests, but they only reveal long-term trends and not the sawdust and wood smoke of the human time frame. Toponyms also help to suggest where forests and specific types of trees once grew; they say nothing about when they disappeared. But if all these types of sources are put together, some general trends of deforestation and environmental change can be established.

According to spore and pollen studies, the steppe has been encroaching on the forest (and the desert on the steppe) for many centuries. Pollen and spore analysis from sites in what is now the Northeast Caucasus steppe suggests a diffusion of forest-steppe in the middle of the first century B.C.E., with parcels of mezolithic forest including beech, lime, pines, birch, and nut trees, and ferns. Topographers studying the sands have concluded that during the same period, the Kuma was a full-flowing mountain river (by the nineteenth century it petered out in the steppe, fifty miles from the Caspian Sea), which could suggest greater forest cover. Soil from the pre-Mongol middle ages has less tree pollen, but still reveals an abundance of fern spores and pollen from plant species that have long since disappeared, including nut and lime trees, hornbeam, and *Gramineae*. Today all of the pollen from the same region comes from semi-desert plants. As the botanist I. P. Falk described it in 1775, 'the entire Kuma steppe has the appearance of a dried-up sea and is treeless, wavy, sandy, and partly covered with clay and salt plains'.<sup>6</sup>

Others have concluded that the mysterious steppe town of Madzhary, which still existed in the thirteenth century, could not have survived in a forestless region. Falk went so far as to claim – based on a mistranslation of an Arabic tombstone inscription – that the town faded away when its inhabitants left for the mountains because of a shortage of forest. It was a popular theory through the nineteenth century; at the least it shows that many in the North Caucasus during the eighteenth and nineteenth centuries were conscious of the precariousness of settlement in a treeless region.<sup>7</sup>

Archaeologists, paleobotanists and topographers concur that the mass distribution of sand and the attendant change in the distribution of plant species occurred in the late middle ages and especially after the Mongol period. They attribute the bulk of the change to human intervention. The North Caucasus steppe had long been a region of pasture for steppe nomads and mountain people; the overpasturing of livestock by Nogais, mountain people, and others destroyed the top vegetation layer and uncovered the sand beneath it. Overgrazing can cause such environmental destruction, and such a thesis is plausible. But pollen and spore study is in its infancy in Russia and previous research has sometimes been ideologically biased, in an effort to prove the ‘irrational’ animal husbandry of pre-Soviet peoples. Without more, and more objective, research, including the study of long-term climatic change, any conclusions as to the cause of deforestation in the middle ages must remain tentative at best.<sup>8</sup>

On the other hand, there is abundant evidence of wood shortages and deforestation during the late eighteenth and nineteenth centuries. Deciduous species grew on both sides of the Terek for a mile or two, but as forts and Cossack villages sprang up, the forest shrank and Cossacks had to obtain wood from further afield. Already in the mid-eighteenth century – when the Cossack population along the Terek was still rather small – there were reports of Terek-Semeinoe Cossacks journeying to the Kumyk plain south of the Terek and to Greben Cossack land in search of wood. The Kizliar commander recommended in 1744 that the Greben ataman closely guard their forest, ‘so that there will not be a shortage of forest in times of need’. The commander of the Caucasus Military Line, General Gudovich, observed around 1770 that there was no forest in the environs of Kizliar and that residents obtained their firewood from higher up the Terek and most of their lumber from towns along the Volga.<sup>9</sup>

Güldenstädt confirmed this picture when he visited the Terek in the early 1770s. He reported that the Terek was nearly devoid of trees up to Kizliar; the forest began only at the Greben Cossack village of Starogladkovskaia and stretched up the river to the west. Mozdok (Circassian for ‘thick forest’) had a forest to the south and the steppe to the north. All of the villages of the Mozdok regiment were ‘sufficiently wooded’.<sup>10</sup> On the other hand, the Cossacks of Chervlennaia of the Greben host were so concerned about their forest reserves that in 1765 they signed a treaty with the trans-Terek village of Devlet-Girei whereby the latter was not to cut the forest along the Terek’s south side without

Chervlennaia's permission. As late as the 1830s, these Cossacks crossed the Terek to cut the forest they considered their own on the right bank.<sup>11</sup>

By the 1820s, after the mass settlement in the North Caucasus had well begun, Cossacks experienced more wood shortages. Lieutenant-general Rtishchev was so concerned about the situation that he reported to Alexander I in 1812 that the forest:

in previous times, about fifteen years ago, was found in complete abundance and perfectly preserved, but having been put under the authority of the forest administration it has been reduced excessively so that in a short time one should expect it to be completely destroyed.

According to colonel Iosif Debu, the Terek-Semeinoe and Terek-Kizliar hosts, and parts of the Volga regiment were in need of forest. Now only two of the Mozdok Cossack villages had sufficient forest, 'but because it is not protected, we can expect that it will soon be completely destroyed'.<sup>12</sup> Writing in 1834, Platon Zubov agreed that the Mozdok Cossack forest was skimpy, but claimed that the Volga Cossacks still had plenty.<sup>13</sup>

The situation became more severe in the 1840s. By 1844, the Greben Cossack ataman was complaining about the destruction of their forest and firewood shortages in Chervlennaia. The commander of the Vladikavkaz regiment, M. S. Il'inskii, reported insufficient forest along the Terek and near the Georgian Military Highway. The Cossacks and military colonists of the upper Terek resorted to illegal cutting of the expansive forest of Kabarda and the latter were selling it all along the Caucasus Military Line.<sup>14</sup> According to an anonymous local writer, the forests in the upper Kuma region were in very poor shape by 1848 – 'the greater part of the residents of [Stavropol'] province suffer an extreme need of forest for building, artisanal work, and heating'. The governor of Stavropol' province confirmed this in his annual report, warning that the state forest in the province was insignificant 'and with each year noticeably grows scarcer, such that the price for firewood recently has increased very much, especially in the town of Stavropol''. Although extensive forests grew in the foothills and the mountains of Kabarda, for most settlers it was too far away and too costly to cut and haul; thus Stavropol', Georgievsk, and Piatigorsk imported lumber from the north via Novochoerkassk, and Kizliar and Mozdok via Astrakhan. As S. D. Nechaev observed in the spa region of the upper Kuma, 'each log, each board of the best structure here have sailed over two thousand versts (1,325 miles)'. He suggested that it cost more to build a sizeable house here than in Moscow.<sup>15</sup>

Official estimates of the extent of forest in the Stavropol' province are extremely unreliable, since there was no general land survey during this period, a shortage of officials to inspect and estimate forests, and no distinctions were made between the health, type, or age of the trees. But based on information from the Forest Department of the Chamber of State Properties, in 1844-1845, the

amount of state forest had shrunk from 29,988 dessiatines [about 81,000 acres] to 27,261 dessiatines [73,600 acres], that is by 9 percent, in just one year. By 1850, state forest plots decreased 24 percent from 19,561 dessiatines [52,800 acres] to 14,825 dessiatines [40,000 acres].<sup>16</sup>

Indeed, a turning point seems to have occurred in the 1840s – it was then that the first large-scale forest conservation measures were attempted in the North Caucasus. Up until 1845, each *stanitsa* (Cossack village) controlled its own forest, under the general oversight of the regimental commander. This changed in 1845 when a system of host forests was created, controlled by the host government and managed by the new office of host forest warden. With this, two large host forests were established along the Caucasus Military Line and Cossacks could cut *stanitsa* forests only with permission of the regimental government, and only in the fall and winter. But just how effective were the new rules? The wardens responsible for inspecting the forests did not receive salaries, so the host forester often worked alone and was limited to one inspection a year.<sup>17</sup> Also, the apportioning of *stanitsa* forests was hardly calculated or equitable. At least in Chervlennaia, according to one resident, Cossacks lined up on a designated day at the end of February and when the ataman gave the signal, leapt on their horses and rushed to the wood with axe in hand, first come, first served.<sup>18</sup>

Further regulations were passed in 1847, following the recommendations of the host ataman who warned that, ‘the forest is in an impoverished condition, such that there is practically no workable timber.’ His main concern seems to have been that Cossacks were using too much young forest for firewood. An imperial *ukaz* adopted all of the ataman’s recommendations, which among other things required Cossacks to plant twenty-five trees annually and forbade them to heat their houses and the regimental headquarters with wood. Instead, they were to use reeds, weeds, and bricks of manure (*kiziak*) ‘which accumulates in great quantities in every courtyard, so this use will have the advantage of cleaning up the courtyards’.<sup>19</sup>

The scarcity of heating fuel was a perennial concern for North Caucasus settlers. The use of reeds, weeds, scrub, and manure was nothing new – Cossacks had always fed these, and anything else combustible they could get their hands on, into their stoves. Everyone in the North Caucasus – Cossacks, steppe nomads, and mountain people – heated with manure bricks as a favourite fuel, but it had an important disadvantage. The more manure went up in smoke, the less was applied to fields and gardens to increase fertility. Manure was especially needed in the lower Terek region, where soil was the poorest; unfortunately this was also one of the most deforested regions and so Cossacks preferred to shovel the ‘black gold’ into their stoves rather than their fields. Even so, their demand for heating fuel remained insatiable: it seems little usable wood was overlooked. When the fortress of Urukhscoe was abandoned in 1843, all of its buildings were demolished and used as firewood. A story was told about an inn in Mozdok that received so little business that it closed down and the billiard table was chopped up for firewood. The lack of fuel could be so severe that sometimes, regiments

hailed firewood with them during expeditions across the Terek, especially in Dagestan.<sup>20</sup>

Another major demand for wood was as lumber for houses, state buildings, and other structures. The first settlers along the Terek often adopted local practices – and adapted better to their environment – by building with adobe bricks, reeds, clay, and wattle. Travellers were often surprised to find so few wooden or stone buildings in Kizliar. Of the 2,084 private houses registered in Kizliar in 1846, only 20 percent were made of wood (and only one of stone).<sup>21</sup>

The Cossacks of the lower Terek combined Russian-style wooden and Caucasian-style clay/wattle architecture. The Greben Cossacks especially were known for their mixed building traditions. Nearly every Cossack had a long and narrow, flat-roofed Caucasian *saklia*, usually constructed out of adobe bricks and a larger, pitched-roof Russian *khata* made from logs. As the host economic administration described it:

After the other *stanitsas*, where most of the buildings are of wattle, adobe, or smooth wood, it is as if you are carried away to some Great Russian village of some forested province: wooded, framed *izbas*, often of oak, and with pitched, high roofs, ornamented on the peak of the gable, with window jambs, and decorated with carvings. But to your astonishment, you also see low Chechen *saklias*, standing in the same courtyard and right next to the Russian *izbas*.

The family lived in the winter in the warmer *saklia*, which was less expensive to heat, and moved to the draughty wooden houses in the summer. The latter had chinks in the walls and were raised off of the silty and sometimes flooded ground, so they were very cold and uninhabitable in the winter. Occasionally Cossacks lived in Nogai or Kalmyk felt tents, especially when they went to their fields in the steppe.<sup>22</sup>

The Cossacks who settled later in the North Caucasus, along the upper Terek and the upper Kuma, and the peasants who moved to the steppe, built more in the Russian and Ukrainian style with wood. The houses in Mozdok, Georgievsk, and Stavropol' were almost all constructed of wood.<sup>23</sup> This was often difficult in the tree-hungry steppe and settlers there resorted to raiding (and destroying) forests, including a protected one near the village of Pokoinoe. Armenians and Russians building near Madzhary looted the ruins of the ancient town for bricks, flagstones, and other materials. They built floors, counters, and benches with Arabic- and Tatar-inscribed tombstones.<sup>24</sup>

Cossacks and state engineers also hacked away at the receding forest to obtain wood for fascines and weirs, which were used to try to restrain the Terek from flooding fields and villages. Engineers made 100,000 fascines for just one weir at the Greben Cossack village of Novogladkovskaia. According to the commander of the Kizliar regiment Alpatov, between 1847 and 1853, engineers strengthening the river bank created 25,000 to 200,000 fascines annually. As a result, the regiment's and many Cossack villages' forests were destroyed and Cossacks had to purchase even vineyard stakes. The commander of the Kizliar



regiment in 1855, Sukhodol'skii, asked that reeds be used for fascines instead of wood because so little of their forest remained.<sup>25</sup> In the wet lower Terek basin, there was no shortage of reeds.

They were fighting a losing battle – the axe proved no match for the river. Removing the forest cover from the drainage-way into the Terek only hastened the flooding. The role of trees in reducing water run off – and erosion – was little known in Russia in the nineteenth century: the humusy forest soil absorbs water, the leaves break the rain's impact on the soil, the roots help hold river banks in place. There is a certain pathos to observe the same commanders report the forest's disappearance and in nearly the same breath express dismay at the nearly annual, very destructive flooding of the Terek.<sup>26</sup>

The military-led war against the forest began in earnest also in the 1840s, when General Ermolov created the Sunzha regiment and began his systematic conquest of Chechnia. Every winter, beginning in 1845, army troop detachments pushed further into Chechnia, spending a month and sometimes two felling trees. They chopped out wide clearings for fortifications and roads. Main roads were cut the width of the distance of two cannon shots, lesser roads the width of one or two rifle shots, and in general trees were removed where it was feared that enemy Chechens could hide before an attack.<sup>27</sup>

Chechens vigorously resisted this deforestation. The push up the Sunzha was one of the war's bloodiest episodes and the wood cutters' progress was followed in the newspaper *Kavkaz* as if it was battle news, with the amount of forest destroyed duly noted. The leader of the mountaineer's resistance Shamil supposedly sent 10,000 men to defend this forest, but to little avail.<sup>28</sup> The same paper reported in 1849 that after the wood-clearing operations of 1846-1847, 'Lesser Chechnia has taken on a completely new appearance'.<sup>29</sup> The deforestation was compounded by a 'multiplier effect' whereby those Chechens not killed during the aggression resettled deeper in the forest and hacked out new clearings for their grain fields and pastures.<sup>30</sup>

Both the military deforestation and the widespread wood trade between Chechens, Kabardians, and others with the Russians must have made a serious impact on the wood stock of Shamil and his forces. Sometime between 1847 and 1853, Shamil promulgated laws restricting woodcutting and prohibiting wood trade with Russians.<sup>31</sup> The maps of Chechnia and Ingushetiia are covered with toponyms derived from tree species that no longer exist there, including yew, chestnut, and plane trees; the great number of names with 'oak' (*nozhai*) suggest the one-time existence of a large oak forest. This silva had not yet disappeared by the mid-nineteenth century, but the axes were making their progress. By 1855, K. Samoilov depicted the Chechen plain from south of the Sunzha to the Terek, 'not long ago one enormous forest' as significantly deforested, either by the military or residents clearing glades for sowing.<sup>32</sup>

Ecology does not respect political boundaries, and Russian troops and Cossacks also suffered from the deforestation south of the Terek. Occasionally

the troops cut down Cossack forests during their road building operations. Firewood only became scarcer for troops south of the Terek. For example, when soldiers laid a road in 1859 from Sulak to Vedeno, it took them a week to get to the forest thirteen miles away, cut their firewood, and haul it back. Also, the hydrology of the region only became worse for those who lived along the Terek (see below).<sup>33</sup>

But the sound of the axe continued to echo through the woods. By the late 1850s and early 1860s, reports of wood shortages, expensive firewood, and embattled forests became louder and more frequent. In 1856, agronomist A. I. Deichman wrote that except for the area next to the main ridge of the Caucasus mountains, the Caucasus *oblast'* was without significant forest and lumber was imported, firewood expensive, and nearly everyone heated with manure bricks. In 1859, colonel Murav'ev inspected the Cossack forests and found most of them in sorry shape. Except for the Volga regiments and the First Sunzha regiment, which had no forests of their own but used those of their neighbours, all of the regiments suffered at least some shortages; and for the Mountain, Vladikavkaz, Mozdok, Kizliar, and villages of the Greben regiment, the situation was extreme.<sup>34</sup>

A. Viskovatov reported that there were only small groves of trees left in the environs of Stavropol' and along the Kuma by 1860. In the same year an anonymous writer in *Voennyi sbornik* claimed a shortage of forest all along the Caucasus Military Line, despite the fact that many *stanitsas* had been founded not long before in the middle of forests. The scraggy forest growing along the Terek was 'a meagre remnant of the previous forests'. He said that the Cossacks heated their homes very poorly and in the winter had to wear warm clothes inside. In Avariia, the cost of brushwood shot up from ten to twenty kopeks per load in 1843 to twenty-five silver rubles per cubic sazhen (a little less than a cubic foot) in 1860. Ataman Sokolov confirmed this picture in the same year, reporting to the chief of staff of the Caucasus army:

It is well-known that the banks of the Kuban, Laba, Urup, Terek, Malka, and others were once covered with thick forests of which now remains only a scrawny forest suitable for brushwood and stakes and in some places for wooden ploughs and poles; in many places not even a trace of such forest remains.<sup>35</sup>

The next attempt at forest conservation comes from this period. After the head commander of the Caucasus corps, Murav'ev, took a trip through the host lands in 1855 and noticed that the Cossack forests were exhausted, an imperial *ukaz* was promulgated in 1856, which laid down a detailed set of rules on forest cutting, planting, the wood trade, and the heating of homes and offices. Forest wardens were to be salaried and new inspectors were to patrol markets and trade bazaars for illegal wood trade. A more detailed schedule of fines and punishments was established for Cossacks who traded or illegally cut wood, or failed to plant or haphazardly planted the requisite twenty-five willows or poplars a

year. This *ukaz* included many other precise prohibitions and regulations about which trees could be cut, when, and by what methods. It also reaffirmed that ‘the heating of houses, more than anything else, exposes the forest to destruction’ and decreed again that all Cossacks heat only with reeds, weeds, straw, manure bricks, scrub, and deadwood.<sup>36</sup>

It seems as if such forest conservation measures came much too late. By the 1860s, there was widespread mourning over the forests that had recently been destroyed the North Caucasus. A. Domanskii wrote of the forests that had disappeared from the banks of the rivers and the wide ravines of Kabarda, reminding readers that Mozdok was named for the ‘dense forest’ that bordered it, which had now vanished. Individual species had reached an enormous size:

Existing to this day are individual stumps two arshins [about four and one-half feet] in diameter, a trough for watering livestock made from an entire oak 15 arshins long [35 feet], and finally, entire houses constructed from ash boards of enormous width; all of this testifies to the size of the forests that once covered the banks of the Terek.

The same author once met a Mozdok resident whose father built his house out of just one oak from the Mozdok forest. But now:

The old dense forest is completely destroyed and in its place have appeared small wood lots of young trees, terribly overgrown with shrubs, and new plantings of pussy willows and aspens that were planted not long ago in spaces between the vineyards. Our foothills are completely bare and only here and there, on the north slope, in deep ravines, can be seen woody spots, oases of a sort, consisting of old, mutilated trunks, the remnants of giants of the past, with withered branches and tall stumps sending out young shoots.<sup>37</sup>

Geographer D. L. Ivanov wrote in 1886 of the great soil erosion of the Stavropol’ region, a result of settlement and deforestation. Villages such as Dubovka (‘oak’) and Berestovok (‘birch bark’), named for their silva, were denuded of forests; areas that had been rich in trees, shrubs, and wildlife were transformed into bare slopes, gullies, gorges, and weeds. When founded in 1790, Kruglolesskoe (‘forest-encircled’) had been surrounded by a thick forest. By the end of the nineteenth century only a ‘pitiful remnant’ survived on the west side and the village was now known by locals simply as Krugloe (‘round’). The story of Chernoleskoe (‘black forest’), founded by Russian settlers in 1799, was typical:

According to old-timers, the village was probably named ‘Chernoleskoe’ because at the time of its founding there grew along the entire stretch of the Tomuzlov River large trees, exclusively of deciduous species. Wild pigs and goats were found in abundance in the forest; there were even deer and bears which had made their way from the forest of the Caucasus mountains. In our time, not even vestiges of this forest remain.<sup>38</sup>

‘THE LAND IS SPOILED BY WATER’

As Ivanov correctly pointed out, one of the results of the great deforestation was a degradation of the land. As the trees were cut in the steppe, streams dried up and land dried out; as trees were cut along the Terek and in its drainage-ways, flooding and siltation worsened. Doctor Toropov, the head physician at the Kutais military hospital, was probably correct to see a connection between forest clearing, land drainage, and the improvement of health in some foothill and plains regions of the North Caucasus. But his maxim that ‘a person who settles in a feverous climate makes it healthy’ did not hold for the lower Terek. It had always been swampy and relatively unhealthy there (see below). But the residents suffered further from the forest clearing undertaken by their up-river brethren – much of the eroded soil created by deforestation in Chechnia and Kabarda ended up in the lower Terek. As siltation worsened, the delta spread and along with it the habitat for malaria-carrying mosquitoes. The same swamps that provided reeds for construction and heating hatched mosquitoes by the millions.<sup>39</sup>

## FLOODING

Deforestation causes water problems, which Cossacks suffered in great measure. ‘Terek, son of the mountains’ as they affectionately called it, was a provider and destroyer. Those Cossacks – and anyone else – who settled too far into the steppe risked water shortages and drought (and a lack of wood). They also suffered power shortages since mills could be built only on rapidly flowing rivers such as the Terek. But those who settled too close to the Terek had to endure unhealthy, boggy environs and regular flooding.

The Russian foothold in the lower Terek region had always been a soggy one. The earliest forts – Terskii Gorod and Sviatoi Krest – were built in wet, unhealthy spots. Kizliar was perhaps even worse. It was surrounded by swamps, standing lakes, and shifting branches of the Terek that made it – at different points in its history – an island. During rainy or snowy periods and when the Terek flooded, the streets of Kizliar would turn to muck and the clay houses soaked up so much water that, according to Falk who was there in 1775, clay dripped from the roofs and the floors became so muddy that one would get stuck if he stood still for too long. As Debu wrote in 1829:

In general the soil there is so waterlogged that every three steps you run into a deep pit, filled with water, and so salty that when the pit dries out it’s as if it was plastered with salt.<sup>40</sup>

By all accounts, Kizliar was a very unhealthy town. The air was thick with ‘miasmatic’ clouds. Fevers were common. Toropov wrote in 1864 that it was hard to find a person there with a healthy facial colour, and added, ‘it would be impossible to choose a place more unsuitable to good hygiene than Kizliar’.<sup>41</sup>

The Terek-Semeinoe and the Terek-Kizliar hosts settled in the same swampy lowlands of the lower Terek, where floods were common. What Debu laconically described for the Terek-Semeinoe host held for both:

Swamps and reeds safeguard their borders: during full water the Terek overflows both our bank and the opposite bank, making creeks, which form swamps, which are disadvantageous to the settlements.

During the Terek's summer flooding, water sometimes stood over four feet deep in Terek-Semeinoe *stanitsas* and vineyards. In general, the further up the Terek you went, the drier the land was, but the river flooded almost all Cossack villages at one time or another and swampy environs were by no means limited to the lower Terek. According to a 1843 survey of the Georgian Military Highway, even villages of the Vladikavkaz regiment in the upper Terek were plagued with floods and bogs.<sup>42</sup>

When Güldenstädt visited the lower Terek in the early 1770s, he recommended resettling Kizliar and the Cossack villages to the right bank of the Terek, where the soil and the climate were better and the harvests more plentiful. But Kizliar and the Cossack villages had been intentionally planted on the left bank of the Terek to take advantage of the cover that the river afforded against enemies to the south. Unfortunately, the Terek 'covered' entirely too much land to the north and the Cossacks who patrolled the river in the summer watched not just for enemy movements but also rising waters. In fact in summer months when the Terek raged, the water was the greater threat; when the rising level promised danger to a village, an alarm was sounded and all of the residents rushed to strengthen the bank's ramparts with fascines. As Lermontov wrote in *A Hero of Our Time*, 'The people and the rivers are as bad as each other – there's no depending on them!'<sup>43</sup>

The Terek was a formidable river. It issued from the highest mountains in Europe, and rushed fast all the way to Kizliar, especially from April to September when the snow was thawing or it was raining in the mountains. Güldenstädt noted that in July and August, its level rose eight to ten feet above normal; the river became furious and flooded many spots. He added:

in many places it not only overflows the bank but makes new branches, filling up the old one with sand, to which it adds trees, and not infrequently even rafts that it has carried from the mountain.

In the lowest spots in the delta below Kizliar, it flooded in the spring and occasionally changed its course. According to an 1834 army survey of the region, all of the *stanitsas* to the east of the Greben village of Shchedrinskaia flooded regularly.<sup>44</sup>

Rivers have histories, just like anything else, and the Terek did not remain static over the centuries, or even over decades. The Cossacks recognised the river's active role in their lives, personalising it with a name and patronymic, and

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giving it a dynamic – and often destructive – personality in folk tales and songs.<sup>45</sup> And indeed, it seemed to be a living creature. A. A. Litvinov observed remarkable changes from 1841 when he first surveyed part of the Kizliar *uezd* to 1863 when he returned to the same spot, most of which was caused by a change in hydrology:

In the place of a swamp could be seen the dry steppe and not infrequently ploughed fields; where the river had run before, now signs of its flow were hardly noticeable and in many places not visible at all; where there was a lake now is a swamp, reeds, or a fine meadow; and on the other hand, where there was before meadows and the steppe, now there drifted impassible sandy mounds (*bugry*).

Many of the branches of the Terek delta were flowing in a completely different place and the main branch of the Terek itself had changed direction from above Kizliar. The entire delta was continually on the move – finding a reliably dry spot among these shifting currents was difficult. Also, over time the alluvium from the mountains and the soil erosion upstream built up the Terek, so that in many places in the lower Terek it was level with the roofs of *stanitsa* buildings. This made flooding all the more likely and all the more dangerous when it happened.<sup>46</sup>

The settlers, though, were not innocent victims of unfriendly forces of nature; they contributed to 'the rage of the Terek', and not only through deforestation. Cossacks and others also tried to manipulate the river for their own ends with canals and dams, and in the process often did more harm than good. Most canals were cut for irrigated agriculture – a necessity for most Cossacks living along the Terek. They dug canals for a couple of miles to their fields in the steppe and released the water in the spring, flooding a predetermined area and bringing nutrient-rich silt to the unmanured land. By fall, the flooded area was ready to plough; if some of the water had not drained, they simply ploughed the drier spots or cut new canals to lead it away. Every year Cossacks, women mostly, dug new canals or deepened old ones. As Ponomarëv put it, 'the work is very hard and exhausting, but necessary because without them the residents would be without grain, vegetables, and vineyards'.<sup>47</sup> Without water and fertiliser their fields were barren.

Unfortunately, the canals also became unintentional flood channels. General Gudovich – sent by Catherine the Great to determine how to strengthen the Russian defence in the North Caucasus – reported that in 1765 the Terek broke through an irrigation canal, flooded Kizliar, and changed its course to make Kizliar a wet, unhealthy island. The Borozda River – one of the branches of the Terek delta – was also originally an irrigation canal; another branch – the Prorva ('the break') – sprouted from it in 1813.<sup>48</sup>

Three new canals were constructed in the early 1850s, the most famous being the Eristov canal, which led from the Malka (a Terek feeder) for more than 130 miles to the steppe. It was one of the grand construction projects of the region, the inspiration of ataman Eristov of the Mountain regiment. And some of the

Cossacks benefited from it, at least for a period. In the words of the commander of the regiment, colonel Tovbich, in 1855:

Now this steppe (which before was without water and nearly useless) is furnished with advantages, such that now, as there never was before, there is ploughing, sowing of grain, and pasturing of horse herds and sheep, and it's supposed that in time farmsteads and water mills will be built and forest planted.<sup>49</sup>

Not all, though, reaped a bountiful harvest. At the beginning of its course, the canal was cut too steeply so that a rapid flow of water quickly eroded it into a seventy-foot-deep ravine. Occasionally livestock and even people fell into it and died. As the canal approached Mozdok, the slope rapidly declined, the water became stagnant, and a swamp grew from the deposited eroded soil. Because it was irregularly repaired and cleaned, banks collapsed and sluices decayed; many *stanitsas* complained that it flooded their pastures and roads and asked that it be destroyed. The Greben Cossacks requested the same for the Shchedrinskii canal, which they contemptuously nicknamed the Shchedrinskii ditch.<sup>50</sup>

Terek-Kizliar Cossacks dug canals from the Terek into the Dolobna, hoping to lead wild carp there; nothing is reported on their fish catch, but the canals flooded all their low-lying lands. The Second Sunzha regiment cut a canal for a water mill. In 1856 the engineer, captain Rypinskii, reported that because the mill was located on such a low spot, the feeder canal had formed a large swamp. 'Up to that time', he said, 'not only was there not a swamp here, but instead a large forest, the traces of which are noticeable yet today.' Others claimed that the swamp ruined the climate and caused sickness. Such mishaps explain why the Kizliar regiment, after allowing Nogais to build a canal through one of their villages, bound them to specific monetary compensation in case of flooding.<sup>51</sup>

Sometimes Cossacks or their commanders tried to dam canals or unruly river branches, but this often created entirely new water problems. In 1850 the commander of the Kizliar regiment dammed a branch of the Elga-Burgun in the Terek delta. When the water flow in the Terek increased as a result, a new branch popped out at Dubovskaia *stanitsa* and flooded fruit gardens and vineyards on the right side of the Terek. Toropov claimed that in the upper Kuma region, it was swampy and feverous precisely where Cossacks had built weirs and mills. Sometimes, down-river villages suffered from a water shortage when weirs were built up river. When two Terek feeders were dammed in 1855 to divert water for the Vladikavkaz regiment *stanitsa* of Arдонаskaia, Arkhonskaia *stanitsa* suffered a complete water loss. Afterwards, Arkhonskaia residents had to travel over five miles to get water.<sup>52</sup>

The Prorva proved to be particularly stubborn. After the flood of 1809, it became the Terek branch with the most water and up to 1847 it frequently flooded Cossack fields, gardens, and residences. Cossacks of Borozdinskaia moved their village closer to the steppe because of flooding in 1814. Engineers built weirs to restrain it, first in 1847, and then when they collapsed, again in

1852. As a result, the Prorva shallowed because water rushed into the Talovka branch of the Terek, flooded the environs, and sometimes cut off all roads between Sosoplinskaia *stanitsa* and Kizliar. The Prorva, meanwhile, silted up, grew even shallower, and fishing at its mouth suffered. It was used to water the best land in the Kizliar regiment, and Cossacks feared that it would soon dry up. So in 1854, work commenced on widening the mouth of the Prorva and blocking the Talovka so Cossacks would be able to continue to water their fields. By 1855, not much had changed – the Talovka flooded Kizliarskaia *stanitsa*; at the same time the commander of the Kizliar regiment reported that there was so little water in the Prorva that he feared great harm. By the next decade, though, the Prorva slogged to the brim and recommenced massive flooding.<sup>53</sup>

The flood of 1863 was probably the decade's worst. In July the heavy snow thaw in the mountains quickly raised the Terek's level and in a short time it was lapping over the earthen flood walls in the *stanitsas* above Kizliar. Soon the water began to leak through the wall at Dubovskaia, formed a 200-foot break and 'an enormous mass of water streamed through', flooding many of the villages, farmsteads, and roads in the environs and forming a new path to the sea. Water rushed through the Prorva, once again devastating Borozdinskaia, flooding the gardens and fields, carrying away the shocks of harvested grain, and deluging the *stanitsa* itself, so that residents had to resettle temporarily to another *stanitsa* and farmstead. The three hardest hit *stanitsas* (Dubovskaia, Borozdinskaia, and Aleksandrovskaia) reportedly suffered losses to the sum of around 180,000 rubles and more than one hundred houses carried away by the water. Not much progress, it seems, had been made since 1809.<sup>54</sup>

Over time, floods took a large toll on Cossack villages, especially in the lower Terek. They frequently forced Cossacks to relocate their villages either further from the river or to a less flood-prone area along the river. In the Greben regiment, Cossacks of Shchedrinskaia moved several of their houses away from the river bank before 1775, lest they be washed away. The entire *stanitsa* was moved in 1823, as were Novogladkovskaia and Starogladkovskaia in 1814, Kurdiukovskaia in 1812, and Chervlennaia in 1816, the latter after a flood destroyed some 200 gardens. In the Terek-Kizliar host, as we have seen, Borozdinskaia moved in 1814; Dubovskaia moved in 1790 when the *stanitsa* was severely flooded and all of its vineyards and orchards destroyed.<sup>55</sup>

Further, as with the 1863 flood, property losses could be enormous. The flood of 1767 ruined Greben Cossack harvested and unharvested grain; hay in ricks, haycocks, and in the field; vineyards; meadows; and in Novogladkovskaia and Chervlennaia, sections of the villages were flooded. They applied to the governor of Astrakhan for financial assistance, but were turned down. The same experience was repeated, usually on a smaller scale, over and over again.<sup>56</sup>

Flooding also helped ruin the most important sector of the Cossack economy of the lower Terek – viticulture. Over time, floods destroyed entire vineyards – soil was washed away and roots were exposed or rotted by standing water. Poorly



drained soil also brought salinisation as salt was drawn to the surface with evaporation. The only way to rid the soil of excess salt was to wash it away with water led from the Terek through canals. But this was time-consuming, laborious work and useless if the vineyard was in a lowland and did not drain properly. At least as early as the 1820s, Cossacks and residents of Kizliar complained about the frequent floods harming their vineyards and decreasing their grape harvest. Beginning in the 1830s, large numbers of vineyards were abandoned and changed into steppe or meadow or swampy lowland. In Kizliar, for example, in 1819 over 13,500 acres of land was in vineyards; by 1838 only 11,000 acres remained. The number of vineyards there decreased from 1,269 to 964 from 1836 to 1828. In the Kizliar regiment, wine production at Starogladkovskaia plummeted from 612,000 litres in 1849 to 130,200 litres in 1856. At Kurdiukovskaia, it dropped from 228,000 to 78,000 litres in the same period.<sup>57</sup>

Cossacks also suffered when their scarce labour force had to abandon field work and other domestic labour to build, maintain, buttress, and repair levees, which by 1850 stretched for over sixty miles along the Terek. For most of their history, Terek Cossacks were responsible for all of this work. From 1846 on, some major dike work was done under the direction of the communications' engineer, with hired workers, paid for by state and host money. But up until then, it was a communal responsibility of the *stanitsa* and even after 1846, the engineers left many vulnerable spots that had to be shored up by the Cossacks.<sup>58</sup>

Earth, wattle, and fascines could not tame the Terek. Water sill flooded during the summer months, breaking through the walls and causing great devastation at the low spots along the levees. In the summer of 1846, the Terek flooded over one-hundred feet west of the embankment at Mozdok and sunk Kizliar beneath six feet of water. Residents paddled in boats along the streets and courtyards trying to save their property. They could not remember such a bad flood in a very long time. Many Cossack gardens, especially in the Kizliar regiment, were destroyed; fields were flooded and covered with silt.<sup>59</sup>

The flood of 1855 drenched fields and gardens in Kizliar for two square miles, flooding the entire left side of the town, raising some houses from their foundations and completely flooding others. Residents abandoned their property, hopped in boats, and paddled to the dry side of town. Again, old-timers claimed it was the worst flood in memory.<sup>60</sup> And every year, engineers cut down more trees, with which to patch up weirs and dikes. The Kizliar regimental government reported in 1859 that strengthening the banks of the Terek, Prorva, and Talovka for the entire distance of the regiment was an extreme necessity, but they did not have the labour or the materials to do it, since the engineer of communications had destroyed almost all of their forest for fascines. It was a wet, vicious circle. And a diseased one.<sup>61</sup>

## DISEASE

The history of colonisation and frontier settlement has been bound up with the history of disease. Often, colonists have been the purveyors of disease, bringing new pathogens for which colonial peoples have no resistance. This was the deadly experience in North and South America, Australia, New Zealand, and Oceania: according to Alfred Crosby, the ease of the conquest of the Americas is in no small measure related to the sickness and death that Europeans unleashed on the native peoples. 'It was their germs', Crosby writes, 'not these imperialists themselves, for all their brutality and callousness, that were chiefly responsible for sweeping aside the indigenes and opening the Neo-Europes to demographic takeover.'<sup>62</sup>

But in other parts of the world, empires struck back with pathogens of their own and colonial settlement became, to use Philip Curtin's term, 'death by migration.' Europeans needed temperate climates to succeed in demographic takeover and establish 'neo-Europes'. As Crosby reminds us, within those familiar latitudes, colonists spread like an escaped weed species:

The only nations in the Temperate Zones outside of Asia which do not have enormous majorities of European whites are Chile, with a population of two-thirds mixed Spanish and Indian stock, and South Africa, where black outnumbered whites six to one. How odd that these two, so many thousands of miles from Europe, should be exceptions in *not* being predominantly pure European.

European colonists were demographically defeated in the tropics by malaria, yellow fever, cholera, and tuberculosis.<sup>63</sup>

The Caucasus is not in the tropics, but cholera and especially malaria killed settlers by the thousands. As in all of Europe at the time, doctors tended to attribute the fevers to the miasmatic climate. The author of an extensive geographic survey of the region claimed that the Terek and the Sunzha regions were among the most feverous places in the North Caucasus, but everywhere up to 1,000 feet above sea level, warmth, wetness and verdure produced a poisonous miasma. Swampy areas were the worst, because plant decomposition was more prevalent there. Toropov depicted a similar 'medical geography' – wherever it was green, wet, and warm, unhealthy miasmas wafted. He too pointed to the particular danger of the Kizliar lowlands, along the Terek and Sunzha tributaries, and wherever rivers and canals flooded the lowlands and millponds.<sup>64</sup>

Others drew a connection between fevers and the over-consumption of fruit. This was just as plausible as the miasma theory, because the vineyards and fruit gardens were most numerous in the same areas – including the lower Terek – where there was the worst flooding and the most fevers. And floods raged, fruits were harvested, and fevers spread all at the same time – from late June to September. On the other hand, the steppe tended to be dry and healthy, and if anything was grown it tended to be grain or grass rather than fruit.<sup>65</sup>

The salient factor in creating conditions ripe for malaria was, of course, standing water providing a habitat for the appropriate mosquitos. And as we have seen, flooding occurred because colonists settled in the lowlands and worsened the region's hydrology for human habitation. The stump, the flood, the swamp, the fever – all were part of the same ecology. In the soggy, sickly areas, one was more likely to die from 'swamp fevers' than from raiding Chechens or Kabardians.

The sickest fort-towns in the North Caucasus seem to have been Kizliar, Georgievsk, and Mozdok. Up to 1749, there apparently was little complaint about the conditions in Kizliar. But then rice was planted, almost to the walls of the fortress itself, and sickness increased so much that sometimes it was difficult to find enough people to staff the guard posts. According to the staff doctor of the medical chancellery in 1750 there were 1,369 men in the field hospitals of three regiments of the regular army sick with fever and diarrhoea. Things were so bad that the army removed the Navaginskii and the Kurinskii regiments from Kizliar and replaced them with the Tenginskii and Samarskii regiments in June 1751. But by 1752, 323 of the Tenginskii regiment and 293 of the Samarskii regiment had died of epidemic diseases. In 1755, another 875 were added to these regiments, but within six months fifty-one had died and the rest were sick and in no condition to work.<sup>66</sup>

The medical chancellery sent a new doctor to Kizliar in 1755 to study and improve the situation. William Gevitt served in Kizliar for only one-half year, but in that time he wrote a valuable 'medical topography'. Gevitt was told that after 1749 when rice was planted near the fortress, the air became heavier. People who worked in the rice fields became sick, turned yellow, got diarrhoea, and became feverish. In 1751, the head commander of Kizliar prohibited the cultivation of rice close to Kizliar, but the sickness continued. No doubt what had been observed was the symptom and not the cause of the problem; the same low topography that permitted rice cultivation made for swampy terrain and provided habitat for disease-bearing mosquitoes. The irrigation canals that watered the numerous fruit gardens, vineyards, and rice paddies in and around Kizliar only made things wetter. Commanders sensed a link between horticulture and the sickness and at one time or another banned not only rice cultivation, but also cotton growing, silkworm breeding, and even the sale of fruit, wine, and vegetables. As Chistovich noted, such measures only served to increase contraband; the sickness raged on. In 1798, for example, 652 in the Kizliar garrison died from sickness. A. M. Pavlov visited Kizliar between 1824 and 1835 and reported that in the summer, two to three and sometimes up to five people died per week because of the unhealthy climate.<sup>67</sup>

Travellers who visited Kizliar almost always mentioned the dank atmosphere and ill health. In the early 1770s, *Güldenstädt* wrote that all around Kizliar it was wet and swampy, with much standing water, and the air was thick and miasmatic. *Falk* observed in 1775 that Kizliar dried out only in the summer and that the dampness was very harmful to health. *Gudovich* in 1792 reported that Kizliar was now an island, surrounded by swamps, frequently flooding, and permeated

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with unhealthy air and sickness. Shidlovskii visited Kizliar in 1843 and remarked that 'a winy, stuffy atmosphere begins to pour over you when you approach the town'. The roads were so wet and muddy in spring and autumn that it was impossible to travel on the streets by vehicle or on foot. Ox carts would remain stuck for months. Irrigation canals rotted with spent yeast from the distilleries and fumes from the surrounding swamps contributed to the generally unhealthy climate.<sup>68</sup>

Georgievsk, on the upper Kuma, was no better. Locals called it 'the cemetery of collegiate assessors' because of the high rate of death there. The site of a Cossack *stanitsa* of the Volga regiment, Georgievsk had a brief period of glory when it became the capital of the *namestnichestvo* (region ruled by governor-general) in 1802. But as the sickness persisted and more and more state servants died, the capital was switched to the healthy steppe town of Stavropol' in 1824.<sup>69</sup>

Observers in Mozdok sounded similar refrains. Gldenstdt in the early 1770s said that, even though it was situated at a low, wooded spot, because it abutted the steppe to the north, the air there was clean and healthy. But Falk reported in 1775 that:

The people and the cattle are very lively, but few of the people live to a very only age. Of the 1,400 of the garrison, from 1 January 1770 to 1 July 1773, 888 died mostly from 'swamp fever' [*gnilaia goriachka*] and diarrhoea [probably dysentery].

He claimed that the unhealthiness was caused by the adobe-walled houses, which would change rapidly from cold to warm and soak up moisture during wet weather. In 1815 Mozdok was described as hot and unhealthy in the summer because of its low situation and the swamps that neighboured it on the east and north sides. The flooding Terek made the environs wet and 'threatens to carry off the very town in time'. Kriukov noted in 1852 that the wide, stagnant irrigation canals harmed the health of the residents. Apparently, the stagnant Eristov canal made things worse in the mid- to late 1850s and fevers increased.<sup>70</sup>

Swamps, mosquitoes, and fevers did not discriminate based on estate. The state peasant village of Pokoinoe, founded in 1766 on the Kuma River by peasants from southern provinces, was so named, according to a resident, because so many died from 'swamp fever' (they became *pokoiniki*, deceased). The Nogai Tatars named the village 'bad place'. There is also abundant evidence that the same conditions often existed in Cossack villages outside the fort-towns. The usual sickness was probably malaria and the most unhealthy areas were from Kizliar to Chervlennaia, around Mozdok and Georgievsk, and the lower course of the Kuma, from Aleksandrovskaiia *stanitsa* to the Caspian. Again and again records report standing water, reeds, swamps and swamp sickness, 'extraordinary and in autumn generally impassable muck', hordes of mosquitoes, and fevers.<sup>71</sup>

Up to 1820, regimental doctors were scarce to nonexistent, and even after that Cossacks seemed to prefer, in Popko's words, 'old women and people who pose as physicians'. To treat malaria they used amulets containing live spiders, snake

skins, or prayers, sprinkles of Candlemas water, and other spells and potions. The *materia medica* of the military doctors, which included salt, chalk, Spanish fly (dried beetles), hemp, and hemlock, was not much more effective. According to military figures, the proportion of those dying from disease did improve as the century wore on – from one out of nine in 1837 to one out of forty-one in 1862, but this probably had more to do with a reorientation of settlement from the wetter, unhealthier areas to the relatively healthier north central and north west Caucasus steppe.<sup>72</sup>

The military accounts of the conquest of the North Caucasus have superbly depicted the eco-warfare that Russian troops waged against their enemies, burning and trampling fields, befouling streams, destroying water reservoirs, chopping down trees, smashing fords, and diverting streams. But Russia also unwittingly practised eco-warfare against itself and this affected Cossack communities in important ways. The anaemia of the lower Terek Cossack economy was caused at least in part by the economic and demographic consequences of the environmental changes described in this article. Deforestation, for example, made them more dependent on traders from the mountains – every stand of trees that the army chopped down boosted the Cossack demand for a commodity that their trans-Terek neighbours could best supply. Flooding and erosion, caused in part by deforestation, washed away the profits from viticulture, which had been the strongest branch of their economy, and in general worsened agricultural land. Sickness and death removed much-needed labour power from their communities – labour that not only would have boosted their chronically labour-short economy, but presumably also would have gone towards extremely necessary ‘public works’ projects such as dike building and swamp drainage. Braudel has written about the great labour power and capital that were necessary to transform the Mediterranean plains into agricultural land and the connection between the shortage of labour and capital and malaria in the plains. In the North Caucasus, the capital and labour were in short supply and the swamps and sickness did not quickly disappear.<sup>73</sup>

Russian literary figures, travellers, and historians created an image of the perils in the North Caucasus, where Chechens and others swooped down from the mountains to plunder, kill, and kidnap. The main danger, though, was more mundane. Disease probably carried off more people than any enemies from across the Terek, and it should be emphasised that these were diseases of poor settlement and environmental transformation, not diseases of war. Nor should Cossacks and other settlers be viewed as innocent victims. They manipulated their environment in harmful ways – removing forest cover, cutting canals, and altering the course of the Terek and other rivers – all of which had severe consequences downstream. It seems they had enough hands to worsen the region’s hydrology, soils, and disease regime, but not enough to fix them.

## NOTES

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<sup>1</sup> See, for example, such classics as Carl Ortwin Sauer, *The Early Spanish Main* (Berkeley: University of California Press, 1966), Alfred W. Crosby, *The Columbian Exchange* (Westport: Greenwood, 1972), and William Cronon, *Changes in the Land* (New York: Hill and Wang, 1983). The French and British were studying the historical dimensions of the environment and nature decades earlier, but the oldest environmental history journal as such is *Environmental History*.

<sup>2</sup> For a brief, general overview of the environment of the North Caucasus see Yu. P. Badenkov and others, 'Caucasia', in *The Earth as Transformed by Human Action*, ed. B. L. Turner, II (Cambridge and New York: Cambridge University Press with Clark University, 1990), 513-31. For a fuller discussion of the failures of Russian imperialism in the North Caucasus and the challenges faced by the Terek Cossacks see Thomas M. Barrett, *At the Edge of Empire: The Terek Cossacks and the North Caucasus Frontier, 1700-1860* (Boulder: Westview, forthcoming).

<sup>3</sup> I. P. Gerasimov, ed., *Kavkaz*. Seriiia 'Prirodnye usloviia i estestvennye resursy' (Moscow: Izdatel'stvo 'Nauka', 1966), 315.

<sup>4</sup> I. V. Rovinskii, 'Khoziaistvennoe opisanie Astrakhanskoi i Kavkazskoi gubernii po grazhdanskomu i estestvennomu ikh sostoianiiu', *Trudy Stavropol'skoi uchenoi arkhivnoi komissii*, no. 2 (1910): section 4, 41-42, 58; Gerasimov, *Kavkaz*, 324-25.

<sup>5</sup> Rossiiskii Gosudarstvennyi Istoricheskii Arkhiv (hereafter RGIA), f. 1268, op. 1, d. 839a, ll. 40-41; Iu. Shidlovskii, 'Zapiski o Kizliare', *Zhurnal Ministerstva vnutrennikh del*, no. 4 (1843): 162; I. I. Dmitrenko, 'Materialy k istorii Terskago kazach'iago voiska', *Terskii sbornik*, no. 4 (1897): 77; I. Debu, 'O nachal' nom ustanovlenii i rasprostraneniia Kavkazskoi linii', *Otechestvennyia zapiski* 18, no. 48 (1824): 274-79, 290-93; N. Toropov, *Opyt' meditsinskoi geografii Kavkaza* (St. Petersburg: Tipografiia Iakova Treia, 1864), 70-75, 92-94; S. A. Chekmenev, ed., *Nekotorye voprosy sotsial'no-ekonomicheskogo razvitiia iugo-vostochnoi Rossii* (Stavropol': Ministerstvo prosveshcheniia RSFSR. Stavropol'skii gosudarstvennyi pedagogicheskii institut, 1970), 6-7; Gerasimov, *Kavkaz*, 214-19, 323-24.

<sup>6</sup> R. V. Fedorova, 'Primenenie sporovo-pyl'tevogo analiza v arkheologicheskikh issledovaniakh prikaspia i predkavkaz'ia', *Sovetskaia arkheologiiia*, no. 1 (1959): 286-90; E. I. Krupnov, 'Za ekonomicheskoe vozrozhdenie raionov prikaspiiskoi nizmennosti', *Sovetskaia arkheologiiia*, no. 3 (1963): 4-8, 10-12; I. P. Falk, 'Zapiski puteshestviia akademika Falka', *Polnoe uchenykh puteshestvii po Rossii* (St. Petersburg: Imperatorskaia akademiia nauk, 1824), 6: 91.

<sup>7</sup> I. Bentkovskii, *Reka Kuma i neobkhodimost' uluchshit' eia ekonomicheskoe znachenie* (Stavropol': no publisher given, 1882; repr. from *Stavropol'skie gubernskie vedomosti*, nos. 27, 28 [1882]), 10-11; Falk, 'Zapiski puteshestviia akademika Falka', 96; L. I. Lavrov, *Epigraficheskie pamiatniki Severnogo Kavkaza* (Moscow: Izdatel'stvo 'Nauka',

1966), 2: 127; 'Vzgliad na Kavkazskuiu liniu', *Severnyi arkhiv*, no. 2 (January 1822): 169.

<sup>8</sup>Krupnov, 'Za ekonomicheskoe vozrozhdenie raionov prikaspiiskoi nizmenosti', 10-12; V. I. Denisin, 'Razvitie zemledeliia u terskikh kazakov i izmenenie prirodnykh uslovii. (K postanovke problemy)' in *Arkheolog-etnograficheskii sbornik*, V. B. Vinogradov, ed. (Groznyi: Checheno-Ingushskii nauchno-issledovatel'skii institut istorii, iazyka i literatury pri Sovete Ministrov Checheno-Ingushskoi ASSR, 1976), 4: 270-72.

<sup>9</sup>Ia. Chistovich, 'Kizliar i ego meditsynskaia topografiia za 100 let do nastoiashchago vremeni', *Voенно-meditsinskii zhurnal* 78 (1860): 10-19; Dmitrenko, 'Materialy k istorii Terskago kazach'iago voiska', 58, 79; F Ponomarëv, 'Materialy dlia istorii Terskago kazach'iago voiska s 1559 po 1880 god', *Voенnyi sbornik* 23, no. 10 (October 1880): 364-65.

<sup>10</sup>I. A. Gil'denshtedt [Johann Anton Gùldenstädt], *Geograficheskoe i statisticheskoe opisanie Gruzii i Kavkaza* (St. Petersburg: Imperatorskaia akademiia nauk, 1809), 2-3, 16-18.

<sup>11</sup>'Istoricheskii svedeniia o Grebenskom kazach'em polku', *Sbornik Obshchestva liubitelei kazach'ei stariny* 4 (1912): 35-36, 52-53; G. A. Tkachëv, *Stanitsa Chervlennaia. Istoricheskii ocherk* (Vladikavkaz: Elektropechatnia tipografii Terskago oblastnago pravleniia, 1912), 53.

<sup>12</sup>Quoted in I. Popko, *Terskie kazaki so starodavnikh vremen. Istoricheskii ocherk* (St. Petersburg: Tipografiia Departmenta udelov, 1880), 182; Debu, 'O nachal'nom ustanovlenii i rasprostraneni Kavkazskoi linii', 276-77, 293; Iosif Debu, *O Kavkazskoi linii i prisoedinennom k nei Chernomorskom voiske* (St. Petersburg: Tipografiia Karla Kraiia, 1829), 47-51, 53-54, 66-68.

<sup>13</sup>Platon Zubov, *Kartina Kavkazskago kraia prinadlezhshchago Rossii, i sopredel'nykh onomu zemel'* (St. Petersburg: Tipografiia Konrada Vingebera, 1834), 126-28, 130-32.

<sup>14</sup>Popko, *Terskie kazaki*, 212-14, 360-62; F. P. Ponomarëv, 'Materialy po istorii Terskago kazach'iago voiska. 2-i Malorossiiskii polk', *Terskii sbornik*, no. 6 (1903): 213-14.

<sup>15</sup>A. V...v, 'Kratkii ocherk Stavropol'skii gubernii v promyshlennom i torgovom otnosheniakh', *Kavkaz*, 22 May 1848, 82-84; RGIA, f. 1268, op. 3, d. 275, l. 21; f. 1268, op. 4, d. 308, l. 30; S. D. Nechaev, 'Otryvki iz putevykh zapisok o Iugo-Vostochnoi Rossii', *Moskovskii telegraf*, no. 7 (1826): section 1, 31-32.

<sup>16</sup>RGIA, f. 1268, op. 1, d. 839a, l. 27; f. 1268, op. 1., d. 839a, l. 148; 'Smeta i taksa na otpusk iz kazennykh dach Stavropol'skoi gubernii lesnykh materialov na 1850-1851 gody', *Izvestiia Kavkazskago otdela Imperatorskago russkago geograficheskago obshchestva* 5, no. 4 (1878): supplement, 30-31.

<sup>17</sup>Rossiiskii Gosudarstvennyi Voенно-Istoricheskii Arkhiv (hereafter RGVIA), f. 1058, op. 1, d. 432, ll. 1-4.

<sup>18</sup>Tkachëv, *Stanitsa Chervlennaia*, 127-28.

<sup>19</sup>RGVIA, f. 1058, op. 1, d. 428, ll. 29-34, 96-97.

<sup>20</sup>Ponomarëv, 'Materialy po istorii Terskago kazach'iago voiska', 223; I. Slivitskii, 'Ocherki Kavkaza i Zakavkaz'ia. Kazatskii khutor i starobriadcheskie skity v Ishorakh', *Kavkaz*, 27 November 1848, 190; M. Liuventseev, 'Razskaz Mozdokskago Armianina', *Kavkaz*, 23 August 1850, 261; Kh. I. K., 'Khoziaistvennyia zametki', *Kavkaz*, 21 January 1850, 23-24; A. I. Deichman, 'Neskol'ko slov o Kavkaze v sel'sko-khoziaistvennom otnoshenii', *Zapiski Kavkazskago obshchestva sel'skago khoziaistva* 2 (1856): 94-95; A. O., 'Rubka lesa', *Voенnyi sbornik* 16 (1860): section 2, 97-100.

## ‘THE LAND IS SPOILED BY WATER’

<sup>21</sup> Chistovich, ‘Kizliar i ego meditsynskaia topografiia’, 10-19; Gil’denshtedt, *Geograficheskoe i statisticheskoe opisanie Gruzii i Kavkaza*, 22-23; Falk, ‘Zapiski puteshestviia akademika Falka’, 64-67; Shidlovskii, ‘Zapiski o Kizliare’, 171-73, 185-87; RGIA, f. 1268, op. 2, d. 887, l. 60.

<sup>22</sup> Rovinskii, ‘Khoziaistvennoe opisanie Astrakhanskoi i Kavkazskoi gubernii’, 52-53; A. Rzhnevskii, ed., *Tertsy. Sbornik istoricheskikh, bytovykh i geograficheskostatisticheskikh svedenii* (Vladikavkaz: Tipografiia Oblastnago pravleniia Terskoï oblasti, 1883), 231-35; Voiskovoe khoziaistvennoe pravlenie, *Statisticheskiia monografii po izsledovaniiu stanichnago byta Terskago kazach’iago voiska* (Vladikavkaz: Tipografiia Terskago oblastnago pravleniia, 1881), 234-36; Pëtr Egorov, ‘Dorozhnyiia zapiski o Kavkaze i Severnom Dagestane, 1851 goda’, *Russkii invalid* 177 (1851): 733-35; Gil’denshtedt, *Geograficheskoe i statisticheskoe opisanie Gruzii i Kavkaza*, 24.

<sup>23</sup> RGIA, f. 1269, op. 2, d. 887, l. 60; ‘Goroda Stavropol’skoi gubernii’, *Izvestiia Kavkazskago otdela Imperatorskago russkago geograficheskago obshchestva* 5, no. 4 (1878): supplement, 14-17; Z...v, ‘Puteshestviia. Poezdka iz Mozdoky’, *Tiflisskiia vedomosti*, 10 July 1830, n.p.; A. V. Fadeev, *Ocherki ekonomicheskogo razvitiia stepnogo predkavkaz’ia v doreformennyi period* (Moscow: Izdatel’stvo Akademii nauk SSSR, 1957), 232.

<sup>24</sup> G. N. Prozritelev, *Stavropol’skaia guberniia v istoricheskom, khoziaistvennom i bytovom otshenii* (Stavropol’: Tipografiia ‘Proletarii’, 1925), 2: 11-12; G. N. Prozritelev, ed., ‘Iz proshlogo Severnogo Kavkaza. Materialy dlia istorii g. Stavropolia i Stavropol’skoi gub.’ *Trudy Stavropol’skoi uchenoi arkhivnoi komisii*, no. 2 (1910): section 4, 25; P. Khitsunov, ‘O mestonakhozhdenii i razvalinakh goroda Madzhar, Stavropol’skoi gubernii, v Piatigorskome uezde’, *Kavkaz*, 2 April 1849, 51-52; A. Tvalchrelidze, *Stavropol’skaia guberniia v statisticheskom, geograficheskome, istoricheskom i sel’sko-khoziaistvennom otsheniiakh* (Stavropol’: Tipografiia M. N. Koritskogo, 1897), 219-20.

<sup>25</sup> RGVIA, f. 1058, op. 1, d. 380, ll. 19, 125-26; f. 1058, op. 1, d. 381, l. 88.

<sup>26</sup> RGVIA, f. 1058, op. 1, d. 380, ll. 125-26, 130; f. 1058, op. 1, d. 381, ll. 9, 40, 46, 64, 88, 194-97. There is some indication that mountain people of the North Caucasus recognised the role of forests in preventing erosion or at least the utility of forest-conservation measures. Chechens, Kabardians, Ossetians, and others had sacred groves that were protected from cutting and there were prohibitions against felling trees by river heads, lakes, and streams. See T. P. Kaznacheeva, ‘Cherty obshchnosti zemledel’cheskoi kul’tury i ekologicheskikh predstavlenii narodov Severnogo Kavkaza v dorevoliutsionnyi period’, in *Problemy agrarnoi istorii narodov Severnogo Kavkaza v dorevoliutsionnyi period*, V. P. Nevskaiia, ed. (Stavropol’: Stavropol’skii gosudarstvennyi pedagogicheskii institut, 1981), 84-85; A. M., ‘Religioznye obiady Osetin, Ingush i ikh soplemennikov, pri raznykh sluchaiakh. II. Prazdniki’, *Kavkaz*, 13 July 1846, 110-12.

<sup>27</sup> K. Samoilov, ‘Zametki o Chechne’, *Panteon* 23, no. 9 (September 1855): section 3, 67-69; V. A. Potto, *Kavkazskaia voina v otdel’nykh ocherkakh, epizodakh, legendakh i biografiakh* (St. Petersburg: Tipografiia R. Golike, 1885), 2: part 1, 107-18.

<sup>28</sup> See for example, ‘Pis’mo k redaktoru iz Dagestana’, *Kavkaz*, 19 January 1846, 9; ‘Vnutreniia izvestiia Kavkaza’, *Kavkaz*, 26 January 1846, 14; ‘Kavkaz’, *Kavkaz*, 1 February 1847, 18.

<sup>29</sup> ‘Kavkaz’, *Kavkaz*, 26 February 1849, 34.

<sup>30</sup> A. P. Berzhe, *Chechniia i chechentsy* (Tiflis: Kavkazskii otdel Imperatorskago russkago geograficheskago obshchestva, 1859), 2-4; Samoilov, ‘Zametki o Chechne’, section 3, 58-60.



- <sup>31</sup> R. Sh. Sharafutdinova, 'Eshchë odin "Nizam" Shamilia', *Pis'mennye pamiatniki vostoka* (1975): 168-71.
- <sup>32</sup> E. M. Murzaev, *Toponimika i geografiia* (Moscow: Nauka, 1995), 65-66; Deniskin, 'Razvitie zemledeliia u terskikh kazakov', 271-73; Samoilov, 'Zametki o Chechne', section 3, 58-60. Berzhe, writing in 1859, concurred. See Berzhe, *Chechnia i chechentsy*, 2-4.
- <sup>33</sup> RGVIA, f. 1058, op. 1, d. 427, ll. 3-4; G. Prozritelev, ed., *Iz proshlago Severnago Kavkaza. Vospominaniia starago kavkaztsa otstavnago vakhtera Mefodiia Stepanovicha Soloduna* (Stavropol': Tipografiia Gubernskago pravleniia, 1914), 15.
- <sup>34</sup> Deichman, 'Neskol'ko slov o Kavkaze', 94-95; RGVIA, f. 1058, op. 1, d. 426, ll. 3-21.
- <sup>35</sup> A. Viskovatov, 'Obshchii kharakter prirodi i cheloveka na Kavkaze', in *Priroda i liudi na kavkaze i za kavkazom* (St. Petersburg, 1869), 1-2; A. O., 'Rubka lesa', section 2, 97-102; RGVIA, f. 1058, op. 1, d. 426, ll. 45-46.
- <sup>36</sup> RGVIA, f. 1058, op. 1, d. 432, ll. 1-4.
- <sup>37</sup> A. Domanskii, 'Sel'skokhoziaistvennyia zametki iz nadterechnago kraia', *Kavkaz*, 30 August-11 September 1864, 382. See also 'Materialy dlia statistiki Kizliarskago polka Terskago kazach'iago voiska', *Voennyi sbornik*, no. 12 (December 1869): 234.
- <sup>38</sup> D. L. Ivanov, 'Vliianie russkoi kolonizatsii na prirodu Stavropol'skago kraia', *Izvestiia Imperatorskago russkago geograficheskago obshchestva* 22, no. 3 (1886): 224-54; Tvalchrelidze, *Stavropol'skaia guberniia*, 14, 62, 204.
- <sup>39</sup> Viskovatov, 'Obshchii kharakter prirodi i cheloveka', 1-2; Toropov, *Opyt' meditsinskoi geografii*, 72-75, 92-94.
- <sup>40</sup> On Terskii Gorod and Sviatoi Krest see F. A. Kotov, 'Khozhdenie na vostok F. A. Kotova v pervoi chetverti XVII veka', *Izvestiia Otdeleniia russkago iazyka i slovestnosti Imperatorskoi akademii nauk* 12, no. 1 (1907): 77-78; D. Vasil'ev, 'Zagadki starogo Kizliara (Kizliar do 1735 goda)', in *Voprosy istorii Dagestana (dosovetskii period)*, V. G. Gadzhiev, ed. (Makhachkala: Dagestanskii filial Akademii nauk SSSR. Institut istorii, iazyka i literatury im. G. Tsadasy, 1974), 3: 39. On Kizliar, Debu, *O Kavkazskoi linii*, 23-26, 47-51; Chistovich, 'Kizliar i ego meditsynskaia topografiia', 10-19; Gil'denshtedt, *Geograficheskoe i statisticheskoe opisanie Gruzii i Kavkaza*, 19-20.
- <sup>41</sup> Ponomarëv, 'Materialy dlia istorii Terskago kazach'iago voiska', 363-64; Falk, 'Zapiski puteshestviia akademika Falka', 65-67; Toropov, *Opyt' meditsinskoi geografii*, 74.
- <sup>42</sup> Gil'denshtedt, *Geograficheskoe i statisticheskoe opisanie Gruzii i Kavkaza*, 16-17; Debu, 'O nachal'nom ustanovlenii', 274-75, 278-79; Debu, *O Kavkazskoi linii*, 47-51; Ponomarëv, 'Materialy po istorii Terskago kazach'iago voiska', 219-22; Toropov, *Opyt' meditsinskoi geografii*, 72-75, 92-94.
- <sup>43</sup> N. P. Gritsenko, *Sotsial'no-ekonomicheskoe razvitie priterechnykh raionov v XVIII-pervoi polovine XIX vv.* (Groznyi: Izdatel'stvo gazety 'Grozenskii Rabochii', 1961), 30-31; Voiskovoe khoziaistvennoe pravlenie, *Statisticheskiiia monografii*, 238-39; M. Iu. Lermontov, *Izbrannye sochineniia* (Moscow: 'Khudozhestvennaia literatura', 1983), 667.
- <sup>44</sup> Gil'denshtedt, *Geograficheskoe i statisticheskoe opisanie Gruzii i Kavkaza*, 2-3, 5-8; Falk, 'Zapiski puteshestviia akademika Falka', 57-58; Popko, *Terskie kazaki*, 365-67. See also P. P. Nadezhdin, *Kavkazskii kraj: Priroda i liudi*, 3d ed. (Tula: Tipografiia Vladimira Nikolaievicha Sokolova, 1901), 65-67.
- <sup>45</sup> See, for example, 'The Rage of Terek, Son of the Mountain' and an accompanying song in Popko, *Terskie kazaki*, 223-41, 505; F. Butova, 'Stanitsa Borozdinskaia, Terskoi oblasti, Kizliarskago okruga', *Sbornik materialov dlia opisaniia mestnostei i plemen Kavkaza*, no. 7 (1889): 119-20.

- <sup>46</sup> A. A. Litvinov, ‘Ob izmeneniiakh techeniia r. Tereka i beregov Kaspiiskago moria s 1841 po 1863 god’, *Zapiski Kavkazskago otdela Imperatorskago russkago geograficheskago obshchestva* 6 (1861): section 4, 83-86; Popko, *Terskie kazaki*, 365-67. See also M. N. Gersevanov, *Ocherk gidrografii Kavkazskago kraia* (St. Petersburg: Tipografiia Ministerstvo putei soobshcheniia, 1886), 45-46, 57.
- <sup>47</sup> F. Ponomarëv, ‘O zemledeľ’cheskikh zaniatiiakh zhitelei Kizliarskago kazach’iago polka’, *Zapiski Kavkazskago obshchestva sel’skago khoziaistva* 15, no. 4 (1869): 130-31; ‘Materialy dlia statistiki Kizliarskago polka’, 228-29.
- <sup>48</sup> Ponomarëv, ‘Materialy dlia istorii Terskago kazach’iago voiska’, 363-64; ‘Materialy dlia istorii Severnago Kavkaza 1787-1792’, *Kavkazskii sbornik* 18 (1897): 446; Shidlovskii, ‘Zapiski o Kizliare’, 163-64.
- <sup>49</sup> Quoted in S. F. Golovchanskii, ‘Kniaz’ Georgii Romanovich Eristov i kanaly – Eristovskii i Kursko-Mar’inskii’, *Zapiski Terskago obshchestva liubiteli kazach’ei stariny*, no. 12 (December 1914): 5-13.
- <sup>50</sup> Gersevanov, *Ocherk gidrografii*, 66-67; Toropov, *Opyt’ meditsinskoï geografii*, 191; Deniskin, ‘Razvitie zemledeliia u terskikh kazakov’, 271-73.
- <sup>51</sup> Debu, ‘O nachal’nom ustanovlenii’, 275; RGVIA, f. 1058, op. 1, d. 385, ll. 2-3; RGVIA, f. 1058, op. 1, d. 502, ll. 30-31.
- <sup>52</sup> Arkadii Iziumov, ‘Stanitsa Aleksandriiskaia’, *Terskiiia vedomosti*, 30 July 1873, 3; Toropov, *Opyt’ meditsinskoï geografii*, 92; RGVIA, f. 1058, op. 1, d. 386, ll. 2-3.
- <sup>53</sup> RGVIA, f. 1058, op. 1, d. 380, ll. 163-64; f. 1058, op. 1, d. 381, ll. 194-97, 201; I. Shabanov, ‘Predokhranitel’nyia mery, prinimaemyia protiv razlivov Tereka’, *Kavkaz*, 28 March 1863, 155-58; Gersevanov, *Ocherk gidrografii*, 58-61; ‘Istoricheskoe svedenie. (Raport komanduiushchago Kizliarskim polkom podp. Alpatova 31 Iiulia 1854 goda No 4530)’, *Sbornik Obshchestva liubiteli kazach’ei stariny*, no. 2 (1912): 16; Debu, ‘O nachal’nom ustanovlenii’, 278-79.
- <sup>54</sup> E. Butovaia, ‘Stanitsa Borozdinskaia, Terskoï oblasti, Kizliarskago okruga’, *Sbornik materialov dlia opisaniia mestnoï i plemen Kavkaza* 7 (1889): 3-5; Litvinov, ‘Ob izmeneniiakh techeniia r. Tereka’, 86-90.
- <sup>55</sup> Falk, ‘Zapiski puteshestviia akademika Falka’, 62; Tkachëv, *Stanitsa Chervlennaia*, 29, 61-63; ‘Istoricheskoe svedenie’, 15-16; ‘Materialy dlia statistiki Kizliarskago polka’, 216.
- <sup>56</sup> Popko, *Terskie kazaki*, 214-22; RGVIA, f. 1058, op. 1, d. 381, ll. 9, 40, 64, 194-97.
- <sup>57</sup> Deichman, ‘Neskol’ko slov o Kavkaze’, 45-49; Debu, ‘O nachal’nom ustanovlenii’, 278-79, 290-93; S. P. P. V., ‘Vinogradnyia zavedeniia v Kizliare’, *Kavkaz*, 12 October 1846, 164; I. Shabanov, ‘Predokhranitel’nyia mery prinimaemyia protiv razlivov Tereka’, *Kavkaz*, 24 March 1863, 151-52; Gritsenko, *Sotsial’no-ekonomicheskoe razvitie priterechnykh raionov*, 49-51; RGVIA, f. 1268, op. 1, d. 839a, ll. 44-46; RGVIA, f. 1058, op. 1, d. 410, l. 4.
- <sup>58</sup> RGVIA, f. 1058, op. 1, d. 380, l. 40; Popko, *Terskie kazaki*, 209-11, 214-17; G. A. Vertepov, ‘Khoziaistvennoe polozhenie nizov’ev reki Tereka’, *Terskii sbornik* 6 (1903): 19-20.
- <sup>59</sup> RGVIA, f. 1058, op. 1, d. 381, l. 9; I. Shabanov, ‘Predokhranitel’nyia mery, prinimaemyia protiv razlivov Tereka’, *Kavkaz*, 17 March 1863, 137-38; Vertepov, ‘Khoziaistvennoe polozhenie nizov’ev’, 19-20; ‘Vnutreniia izvestiia Kavkaza’, *Kavkaz*, 5 August 1846, 121; 31 August 1846, 139; 7 September 1846, 142.
- <sup>60</sup> Nikolai Krasovich, ‘Navodenie v Kizliare’, *Kavkaz*, 31 August 1855, 291.
- <sup>61</sup> RGVIA, f. 1058, op. 1, d. 426, ll. 19-21.

<sup>62</sup> Alfred W. Crosby, *Ecological Imperialism: The Biological Expansion of Europe, 900-1900* (Cambridge: Cambridge University Press, 1986), 196. See also Alfred W. Crosby, Jr., *The Columbian Exchange* (Westport, Connecticut: Greenwood Press, 1972).

<sup>63</sup> Philip D. Curtin, *Death by Migration: Europe's Encounter with the Tropical World in the Nineteenth Century* (Cambridge: Cambridge University Press, 1989); Alfred W. Crosby, 'Ecological Imperialism: The Overseas Migration of Western Europeans as a Biological Phenomenon', in *The Ends of the Earth*, Donald Worster, ed. (Cambridge: Cambridge University Press, 1988), 104.

<sup>64</sup> Nadezhdin, *Kavkazskii kraï*, 93-94; Toropov, *Opyt'' meditsinskoi geografii*, 3, 74, 92-94, 186. The information on cholera is sketchier, but we do know that there was an epidemic in 1847, which hit Mozdok and Vladikavkaz regiments and killed at least 279. See 'Kavkaz', *Kavkaz*, 11 October 1847, 161; Tkachëv, *Stanitsa Chervlennaia*, 147; A. Pliushch, 'Stanitsa Urukhskaia. Istoriko-ekonomicheskii ocherk', *Terskii sbornik* 5 (1903): 97; P. Nitskin, 'Byvshiaia voennia poseleniia na Voенno-Gruzinskoi doroge', *Terskiiia vedomosti*, 5 March 1887, 2.

<sup>65</sup> RGIA, f. 1268, op. 1, d. 839a, l. 39; 'Materialy dlia statistiki Kizliarskago polka', 223-25.

<sup>66</sup> Chistovich, 'Kizliar i ego meditsynskaia topografiia', section 3, 3-10.

<sup>67</sup> Chistovich, 'Kizliar i ego meditsynskaia topografiia', section 3, 27-33; A. [M.] Pavlov, *O aziatskikh narodakh, obitaiushchikh v iuzhnoi Rossii* (St. Petersburg: Tipografiia Kh. Gintsa, 1841), 5.

<sup>68</sup> Gil'denshtedt, *Geograficheskoe i statisticheskoe opisanie Gruzii i Kavkaza*, 19-20; Falk, 'Zapiski puteshestviia akademika Falka', 65; 'Materialy dlia istorii Severnogo Kavkaza', 446; Shidlovskii, 'Zapiski o Kizliare', 165, 173-74.

<sup>69</sup> G. N. Prozritelev, 'Istchnik Karabin. K istorii goroda Stavropolia', *Sbornik svedenii o Severnom Kavkaze* 11 (1914): 1-11; Nadezhdin, *Kavkazskii kraï*, 360-61; 'Goroda Stavropol'skoi gubernii', *Izvestiia Kavkazskago otdela Imperatorskago russkago geograficheskago obshchestva* 5, no. 4 (1878): supplement, 14-17; Mikhail Kriukov, 'Goroda Stavropol'skoi gubernii', *Stavropol'skii gubernskiiia vedomosti*, 8 April 1850, 168.

<sup>70</sup> Gil'denshtedt, *Geograficheskoe i statisticheskoe opisanie Gruzii i Kavkaza*, 16; Falk, 'Zapiski puteshestviia akademika Falka', 59-60; Gr. Gord...v, 'Puteshestviia. Poezdka iz Pol'shi za Kavkaz', *Tiflisskiiia vedomosti*, 20 February 1830, n.p.; Kriukov, 'Putevyia zametki', *Izvestiia Kavkazskago otdela Imperatorskago russkago geograficheskago obshchestva* 5, no. 4 (1878): supplement, 62-63; Gersevanov, *Ocherk gidrografii*, 66-67.

<sup>71</sup> Tvalchrelidze, *Stavropol'skaia guberniia*, 408; Popko, *Terskie kazaki*, 297-98; Debu, *O Kavkazskoi linii*, 288; 'Materialy dlia statistiki Kizliarskago polka', 228-29; Voiskovoe khoziaistvennoe pravlenie, *Statisticheskiiia monografii*, 238-39; Tkachëv, *Stanitsa Chervlennaia*, 9; RGVA, f. 1058, op. 1, d. 385, ll. 2-3.

<sup>72</sup> Popko, *Terskie kazaki*, 208, 297-98; Toropov, *Opyt'' meditsinskoi geografii*, 3.

<sup>73</sup> Fernand Braudel, *The Mediterranean and the Mediterranean World in the Age of Philip II*, trans. Siân Reynolds (New York: Harper & Row, 1972), 1: 60-85