In Single File

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agencies, 1858-1917

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l'environnement en ordre de marche, 1858-1917*

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- 1 The most effective soil conservation agencies in the Russian south at the end of the tsarist period were the Russian Army of the Don and the Vladikavkaz railroad. These were, to be more precise, the only state institutions implementing soil conservation measures in the Russian south at that time. The army and the railroad had no rivals, aside from the Russian Forest Department, which only maintained experiment stations on the steppe. These experiment stations did not actually carry out the work of propagating forests, but instead studied the best methods for establishing new forests in semi-arid conditions. (The Agricultural Society of Southern Russia had some success in establishing forests in the Russian south, but only by advising large landowners.¹) The work of propagating state forests was left to the Cossack Army of the Don, and to a much lesser degree, the Vladikavkaz railroad. For reasons ideological, practical, and economic, the imperial government chose to work through intermediary groups and private agencies rather than via direct action, with significant long-term effects on soil conservation efforts in the twentieth century.
- 2 To the extent that environmental historians have examined Russian agronomy and soil conservation in the tsarist era, they have focused their attention on ideas rather than implementation.² And with good reason: the knowledge-building infrastructure was much better developed than the network of agencies tasked with improving soil conditions. A number of very active scholarly debates about human agricultural activity on the steppe percolated in Russia throughout the nineteenth century, and the exchanges occupied prominent places in the publications of the Free Economic Society, the Imperial Moscow Society of Agriculture, the Imperial Forest Institute, and the scientific press. Scores of scientists studied the processes whereby, as Leslie Symons documents, “blowing sands buried over 10,000 hectares of cultivated land between 1843 and 1868” in the Lower

Dniepr basin.³ The most famous side of the debate, articulated by the pioneering soil scientist Vasilii Dokuchaev, held that inappropriate agronomical techniques had disturbed the ecology of the steppe environment.⁴ In a report submitted to the imperial government after the Russian crop failure of 1891, Dokuchaev argued that gullies and drifting sand, coupled with dropping ground water level, were the direct consequence of poor land management that desiccated the landscape, which in turn led to chronic crop failure on the steppe.⁵ According to Dokuchaev, farmers who carelessly stripped the land of its vegetative cover in moister parts of the steppe saw their fields invaded by gullies, which in time washed away the topsoil. Similar practices in dry regions did not create gullies but instead great patches of blowing sand, rendering vast swathes of land useless for agriculture and exacerbating summer dust storms. Dokuchaev's report, because of its favorable reception and the relatively early date of its publication, occupies a central position in the history of the study of anthropogenic climate change, and scholars have paid due attention.⁶ However, this is not the case for the implementation of Dokuchaev's ideas in the tsarist period—or, for that matter, for those of other pedologists—perhaps because the application was much less well organized and much less well documented than the debate.

- 3 The most commonly prescribed remedy for the disturbed ecology of the steppe in the mid-nineteenth century, and again after the 1891 drought, was afforestation. Not all Russian soil scientists agreed that the steppe had been forested in the recent past, and Dokuchaev himself believed the steppe had been grassland for a very long time, but there was a significant cohort of Russian agronomists and soil scientists who hypothesized that the steppe had been forested in the years before Russian settlement.⁷ Accordingly, they blamed the removal of the forest cover for agriculture for the ecological problems. But regardless of the disagreement as to whether forests “belonged” on the steppe, Russian experts, often under the influence of German geographical studies, generally supported the idea that increased forest cover could reverse the drying of the steppe.⁸ Immediately after the publication of Dokuchaev's report, the Russian government significantly stepped up its long-standing support of steppe afforestation research via the Forest Department and Imperial Forest Institute, and continued to do so right up until the revolution, an implicit endorsement of the idea that forestry measures were the best solution for environmental degradation. David Moon argues that by the year 1900 or so, a number of Russian scientists had come to doubt the deforestation premise, and began to promote careful agricultural techniques rather than the creation of new forests. However, it remains very uncertain how widespread this position became, and even if Moon is correct about a new consensus, afforestation efforts maintained a very prominent place in Russian agronomical literature after 1900. Afforestation research continued to receive state attention and funding, whereas improved agricultural techniques appeared largely in agronomical journals and experiment stations but not in the fields.⁹ Indeed, afforestation remained a point of emphasis beyond the tsarist period, most prominently as the focus of the Great Stalin Plan for the Transformation of Nature, and later as part of extensive afforestation efforts under Brezhnev.¹⁰
- 4 Because afforestation was the most widespread method for Russian soil conservation in the late tsarist period, the system that the Russian government used for its implementation, although generally unstudied, influenced both the outcome of the efforts and helped to form the deeper message conveyed to the Russian public about soil conservation work, and the state-society relationship more generally. State experimental

stations carried out the research to determine the best species and methods for steppe afforestation, but the stations themselves did not usually actually perform the work of placing the forests on the steppe, nor did they actively reach out to involve the populace in their work. The Russian government preferred to implement afforestation by employing existing actors rather than by creating dedicated institutions, just as it did when requiring homeowners to maintain the gardens on Moscow's Garden Ring. Foremost among these agencies were the military and the railroad—specifically the Russian Cossack Army of the Don, and the Vladikavkaz railroad—and the choice to entrust afforestation to agencies with strongly differing primary objectives led to a rigid and impersonal system that fit uneasily with the goals of conservationism.

- 5 At stake was more than just the integrity of the steppe ecosystem. In a larger sense, soil conservation was only part of a larger and ultimately failed effort to create a modern civil society that integrated government authority and educated opinion with the rural population. A growing trend in the historiography of the late imperial period has drawn attention to the attempt of Russian scientific experts to help forge a cohesive and united modern Russia, with social relations based in cooperation rather than coercion, although a consensus so far has not emerged. Among the first works to explore this relationship was George Yaney's *The Urge to Mobilize*, which severely critiqued "capital-city minds" and the tendency of central authorities to reform the countryside without much understanding of the peasantry.¹¹ For Yaney, agrarian reform in Russia moved more unevenly and more oppressively than it should have, because "administrators and technicians in the countryside were seeking not to bring benefits primarily to peasants but to satisfy their own inner need to force the rural population into conformity with 'modern' assumptions regarding human nature."¹² Yanni Kotsonis' *Making Peasants Backward* arrived at many of the same conclusions, indicting agronomical experts for their disdainful attitude toward the peasantry, which resulted not in tighter connections between town and village but quite the opposite.¹³ The same could be said for Judith Pallot's *Land Reform in Russia, 1906-1917*, as Pallot criticizes educated officials for their inability to understand how responsive to external conditions the Russian peasant could be, if approached properly.¹⁴ The result, as David Kerans asserts in *Mind and Labor on the Farm in Black Earth Russia, 1861-1914*, was "indifference and complacency towards science and agricultural improvement" among the peasants that "generated a wave of despair among the community of agronomic experts."¹⁵ These works serve to explain the social breakdown that ultimately resulted in the calamity of the Bolshevik Revolution and the tragedy of collectivization. At the same time, they describe a very interventionist and overbearing state apparatus, eager to aggressively subdue the population and thereby generating considerable ill will.
- 6 More recently, historians investigating the urban-rural relationship have arrived at a different and more positive characterization of agricultural reform. Ol'ga Elina's *Ot tsarskikh sadov do sovetskikh polei: Istoriia sel'skokhoziaistvennykh opytnykh uchrezhdenii XVIII-20-e gody XX v.* finds much to celebrate in Russian experimental agriculture, and shows that for more than two centuries, beyond the revolutionary period and at least until the eve of the Stalin era, Russian agronomists built a heritage of innovative and fruitful experimentation that definitely improved agricultural productivity in Russia, and indeed throughout the world.¹⁶ Ilya Gerasimov's *Modernism and Public Reform in Late Imperial Russia* also tells a story of progress, at the outset implicitly agreeing with Yaney's characterization of agricultural experts as dismissive

and condescending, but then illustrating how direct contact with the rural population changed the experts and brought them into a closer alliance with the peasantry against the state.¹⁷ These two books provide some much-needed nuance to a perspective that had become monolithically negative, and moreover, Elina's discussion about the unique and partially privatized funding method for Russian agronomy, points the way to a fuller understanding of the dynamics in the countryside. And yet Elina and Gerasimov tell stories that would seem to lead toward Russian social integration and agricultural progress. As is true for Moon's narrative, they describe breakthroughs and trajectories that, even if real, did not alter the practices of Russian agriculturalists appreciably. Put another way, recent works that view the intentions and actions of tsarist elites more charitably provide a basis for optimism that does not accord well with actual conditions. Out on the steppe, at the end of the tsarist period, ecological problems were not improving, but more importantly, the state's chosen vehicles for environmental amelioration were not capable of delivering unambiguous messages about how to redress the worsening conditions.

- 7 Much more useful in explaining the limited success of tsarist-era soil conservation efforts is Ekaterina Pravilova's *A Public Empire*, in which Russian society is portrayed as deeply conflicted about the concept of the common good, and the Russian government as hesitant to assert itself when faced with problems of a public nature.¹⁸ Pravilova discusses a number of crises in the late-tsarist era, including deforestation and the deterioration of historical monuments, which resisted easy classification as public or private problems. Russian liberals urged the government to act boldly in defense of the common good as they defined it, hoping that they "could create the nation by giving it a material foundation," while tsarist practice generally treated private property as sacrosanct and relied upon property owners to find the best solutions.¹⁹ And yet the example of emancipation demonstrated that the state recognized a duty to redefine property rights dramatically, provided that the problem merited decisive action. As a result, the tsarist state charted a diffident course when navigating the public sphere, or *res publica*:

facing the difficulties of governing the society of private owners, the state [...] preserved different intermediate institutions, such as peasant communes, that facilitated governance and helped the state avoid "face-to-face" contact with property holders.²⁰

- 8 The tsarist state acted in almost exactly the same way when pursuing soil conservation, with similarly ambiguous results. The result of the debate over the common good was a "mission unaccomplished," with ambivalent tsarist-era policies producing "fractures in the system of property rights" that grew larger and more problematic during the era of war and revolution.²¹ Likewise, the decision to work through intermediaries in soil conservation limited direct contact between agronomists and the peasant masses, thereby making soil conservation a province of the powerful.

The creation of military forests

- 9 From the very beginning of the Russian afforestation project, the state relied on the Cossack Army as a ready source of labor, despite the uneasy fit between its military mission and land reclamation work. In 1835, forty-nine years after the formation of the Don Military Province, the Irregular Cossack Army of the Don first received the order from Imperial Ministry of the Army to manage its own forests, so as to provide the army

with supplies of wood.²² These forests, referred to in state correspondence as “military forests” (voiskovye lesa), also generated wood that was rationed out to soldiers for their personal use.²³ In this way, forest products became part of the agreement between the Russian government and the Cossack host, whereby the Cossacks received special privileges, including the right to own land, in return for reliable state service.²⁴ The right to choose the best methods on personal plots of land, including forested plots, was legally guaranteed to the station communes, individual Cossacks and their designees. However, despite the latitude granted to the Host, each Cossack was obligated to plant twenty-five willow or poplar trees per year on his homestead.²⁵ As time went by, the state’s requirements grew more explicit and codified. Throughout the 1870s, the military command gave more frequent recommendations to the Cossacks about forestry practices, and in 1877, the central military command in St. Petersburg negotiated for the right to issue orders to the local Ataman (usually worded as polite requests) indicating the best methods and best locations for forest propagation.²⁶ As a result, the Cossack Host came to own the task of soil conservation in southern Russia.

Fig. 1 : Ivan Fedorovich, Bogdanovich, Zemli voiska donskago [Lands of the Don Cossack Host], 1833

<http://kruglovka.ru/images/maps/podrobnaya-karta-zemli-vojska-donskogo.jpg>.

- 10 The duty to afforest the steppe fell to the Cossack Army largely for practical reasons. In the early nineteenth century, the southern steppe was a thinly populated borderland with sparse infrastructure, whereas the armed forces represented a ready source of manpower with a well-established chain of command. No additional state resources were required to create an institutional framework. Private landowners were encouraged to plant new forests, and immigrants were required to do so by Russian law, but these two groups were relatively small and achieved very little, given that only Cossacks possessed

the right to own land in the Russian south. Beyond these requirements, the state proved very unwilling to insinuate itself in the village commune to improve agronomical methods, leaving the army as the best-disposed organization to carry out the work.²⁷ Institutional inertia ensured that the arrangement created in the early nineteenth century remained in force until the end of the imperial period. As V.V. Morachevskii, the director of the Informational and Publishing Bureau of the Ministry of Agriculture wrote in 1914, the tsarist government accomplished very little in the field of agricultural education in the decades following emancipation, perhaps even less than in the thirty years of Nicholas I's reign.²⁸ The Russian Empire did not have a Ministry of Agriculture that might hypothetically have directed afforestation efforts until 1894, when the Ministry of State Property was reorganized in response to the famines of 1891 and 1892,²⁹ and even after that the government focused what resources it had on increasing yield rather than combatting erosion.³⁰ By this time, the Cossack system had taken hold.

- 11 The Cossacks, in response to their new duties, had little choice but to employ professional foresters to manage their forests and established new forests, and as a result, an influential intellectual circuit centered on military forests developed. Work on the military forests became a rite of passage for students at the St. Petersburg Forest Institute, and a tour of duty in a Cossack military forest enabled many of them to advance from Forester Second Class to First Class, thus helping to shape their later professional outlook.³¹ As Georgii and Nina Red'ko discuss in *Istoriia lesnogo khoziaistva Rossii*, a very small percentage of foresters remained in the south permanently, and for the foresters in training who made up the bulk of the experts, steppe afforestation work took on the quality of a post in an imperial hinterland.³² Foresters from the various army forests frequently held conferences to compare notes, evaluating and refining successful afforestation techniques developed by the Forest Department at a time when no one did aside from the scholars.³³ As a result, an integrated space of knowledge, dominated by professionally trained experts, emerged. But the method of knowledge production and knowledge transfer among the foresters took on a hermetic quality, with expertise most often taken back to the metropole when the cadet left after a year or two. The foresters did not work with the public, but only with the experimenters at the test plots of the Russian Forest Department, and with their supervisors in the Cossack Army.
- 12 In the first decades after 1835, the Cossack authorities sometimes displayed an indifferent or antagonistic attitude toward their forestry duties, but over time they appear to have embraced the teachings of their forester employees, and increasingly took the lead in pursuing its conservationist responsibilities. During these earlier years, the Cossack administration assigned their troops to forest guard duty for only one year at a time, although multiple years were required to learn the job. In 1851, the Ataman issued his own rules for violations of the 1835 regulations, eliminating the threat of dismissal for violators. In 1877, false rumors about the transfer of Cossack woodlands to the oblast government (as punishment for failing to observe best practices) resulted in a fury of unauthorized logging.³⁴ But there was steady movement in the other direction; in 1879, the Don Army Administration had taken to complaining about the shortcomings of its own forest department, noting in its annual report that
the forest department, by the way, has expressed its agreement that until now there has been too little attention turned to the highly important cultivation work for afforestation, occupied often by flying sands, and the securing of which, in our opinion, presents an urgent need.³⁵

- 13 The number of forest guards slowly drifted upward, from four in 1869 to 180 in 1890 to 263 in 1914.³⁶ Toward the end of the tsarist era, the Cossack Army administration began to award prizes, with funds drawn from their own resources, to local citizens and communes for afforestation work and success in securing sands. Those who established 10 *desiatins* of new forest on sands received a first-class prize, and received a silver medal and a two hundred ruble cash prize; those who planted 5 000 seedlings or more won a second-class prize, consisting of a silver medal. These prizes were awarded annually until 1914.³⁷
- 14 At the same time, there is evidence that the military method of administration influenced the practice of forest management on the southern steppes in a negative way, especially with respect to regimentation and rigidity. For instance, foresters had to file annual reports about their proposed methods and scale of work, with budgets down to the kopeck and areas to be afforested down to the square *sazhen*.³⁸ There were instances when foresters had to ask permission to cut as few as five cubic meters of wood in order to create boundary fences.³⁹ Foresters were obligated to follow planting patterns exactly; from 1858 until 1879, for instance, army foresters were ordered to follow the instructions of the guberniia governor, H.G. Mal'gin, and to plant willow trees in rows, strictly alternating with rows of pine, oak, birch, and white acacia in a predetermined pattern. In 1879, this pattern was altered in an official decree issued by the Ataman to feature a precise ratio of fifteen ash trees, five white acacia, five maple, and five of yellow acacia, planted to a depth of half an *arshin* and at a density of 14,400 seedlings per hectare.⁴⁰ These prescriptions, issued for entire regions regardless of local variation, brought poor results: in 1880, for instance, 99.5% of seedlings in the Orekhovaia forest district died, because, according to the responsible forester, the instructions were designed for black earth soils, whereas those in his area were of the chestnut type.⁴¹ In 1897, a new plantation established on a patch of sand between the Medveditsa and Ilovaia Rivers completely perished because the instructions were better suited to the northern section of the steppe.⁴² Another negative aspect of the militarized nature of the project was the reluctant if not resentful attitude of ordinary Cossacks toward the afforestation effort who did not see forestry as properly part of their duties; authorities often complained about the failure of Cossacks to report for duty, or the habit of sending underage children to do the work.⁴³
- 15 Despite these serious impediments, the Cossack Army was by far the agency responsible for establishing the most new forest on the southern steppe in the nineteenth and early twentieth century. In the first five years of the army's efforts, four million trees were planted, and almost fifteen million by the year 1849.⁴⁴ Given a standard density of 14,400 trees per hectare, this would mean that the Cossack Army established more than a thousand hectares of new forest by 1850, although ostensibly not all survived. Efforts greatly accelerated in the 1870s, in response to the growing scientific consensus about ecological degradation, and by the end of that decade, each of the ten Cossack forest districts was planting between 30 and 50 *desiatins* of new forest each year (roughly 35 to 55 hectares), or 300 to 500 hectares per year, at an expense of 3 000 rubles per year.⁴⁵ By the 1890s the annual expenses reached 35,000 rubles.⁴⁶ By 1890, the Cossack Army had established 24,418 *desiatins* of forest, and by 1900 that number had grown to 29,534 *desiatins*. On the eve of the revolution, the Army had succeeded in cultivating 36,799 *desiatins*, nearly all of which were near rivers (to control gullies) or drifting sands, whereas it is estimated that before the afforestation work, these ten districts had 27,306 *desiatins* of forest.⁴⁷ Although these numbers pale in comparison with those achieved by

the Soviets in the 1920s and 1930s, the population base and the infrastructure were much more extensive in the twentieth century. A million settlers arrived in the region between 1860 and 1900, and another seven hundred thousand in the fourteen years after that. When compared with the accomplishments of contemporary institutions, the results of the army's efforts are more impressive. Comprehensive totals for forests planted by private landowners do not exist, but other agencies achieved essentially nothing. The Appanage Department of Samara and Stavropol' provinces, succeeded in establishing only 8.1 desiatins by the year 1885.⁴⁸ Likewise, the zemstva succeeded in establishing almost no new forests despite frequent encouragement to do so, although there was some success in encouraging peasant communes to plant shrubs near their fields.⁴⁹

- 16 Thus the tsarist government devised, in an improvised manner, an enlightened plan to ensure that the Cossacks were supplied with sufficient timber, which then slowly transformed into a program to safeguard the southern steppe from ecological degradation. The conflicting interests produced notable results, but nonetheless only partial success. Choosing to remain hidden behind other institutions, the state did not create an agency able to establish the millions of desiatins of forest that experts suggested would be needed to produce any macroscopic change. The most salient counterexample here is France, which in 1859 passed laws about forest-centered erosion control and in 1882 initiated active campaigns of pasture improvement and erosion abatement under the direction of the French Forest Service; Austria-Hungary then emulated French methods in the late nineteenth century.⁵⁰ This is not to say the forests built in the Russian way, planted by the Cossack Army and the Vladikavkaz railroad, did not help combat soil erosion, the spread of gullies, and drifting sands.⁵¹ The American forester Gifford Pinchot visited Russia in 1902 and reported being told that the forests were designed exclusively to combat erosion, and that they appeared to be succeeding admirably.⁵² The archival record corroborates Pinchot's claims about the rationale for the forests or their beneficial influence. However, in spite of the positive effect that these forests may have had, the area of blowing sands at that very time was nevertheless increasing by 6 000 desiatins annually.⁵³
- 17 It would seem that choice to use the army as the primary soil conservation agency in the Russian south was successful in limited terms, in that the program launched successfully and annual targets were met. However, it is also clear that from a larger perspective, the military, with its other responsibilities, its internal conflicts and its limited authority over the civilian population, was unable to address the problem systematically. There is no evidence that the Cossacks were instructed to adopt more careful agricultural practices to alleviate erosion, and thus no thoroughgoing or integrated program for soil conservation materialized. In addition, the Cossack Host, unlike the French Forest Service, had no authorization to address the problem systematically, and therefore the total amount of eroded land grew regularly on lands not under their control. Furthermore, the decision to "outsource" conservation work through a sometimes unwilling bureaucracy had long-term effects on attitudes about environmental work in the Russian south, which will be discussed below.

The creation of the railroad forests

- 18 A second institution that played a prominent and perhaps unexpected role in conservation work was the Vladikavkaz railroad. Its participation took two forms. The

first form was directed at reversing the damage done during the creation of railroads. The cutting of roadbeds, like the creating of plowed fields, stripped the upper layer of vegetation from large swathes of land, which in turn often formed patches of sand and gullies capable of spreading and threatening agricultural zones. In addition, the gullies and drifting sands destabilized the railbeds and gave rise to serious dust storms that interfered with the regular travel of the trains. When this occurred, and the oblast government received complaints from farmers, the railroad officials received orders from the government to hire foresters and afforest the land themselves.⁵⁴ The number of hectares afforested in this way annually numbered in the dozens—small perhaps, but roughly equal to the amount established by the zemstva. This arrangement remained in place well into the Soviet era.⁵⁵

Fig. 2 : 100 ruble note issued in 1918 by the administration by the Society of the Vladikavkaz Railroad depicting the routes under its control

- 19 The railroads played a second, less direct but more important role in disseminating soil conservation information among the rural population, but their message contradicted itself at its foundation. The Vladikavkaz railroad supplied the funding without which public agricultural education would not have taken place on the steppe in the tsarist era. Although deforestation was identified as a leading cause of environmental degradation, Russian experts also recognized, as described in *The Plough That Broke the Steppes*, that the predominant agricultural methods of the Russian peasant had evolved at a time of plentiful land and ample opportunity for extensive areas of fallow. However, by the end of the nineteenth century, the population density no longer allowed for the extended resting of land. The increased population density was exacerbated by the loss of some land to exhaustion and abandonment. In 1872, the oblast administration conducted a survey indicating that there were 7,953,672 desiatins of arable land in the oblast, but a subsequent survey conducted in 1896 revealed that this number had fallen to 7,443,052, a decrease of six percent in only one generation.⁵⁶ Another survey, conducted in 1907, showed that fertile land had decreased by 60% when compared with the 1850s, and in some places in Don okrug, the losses reached 90%.⁵⁷ A vicious circle had developed, wherein the pressure to exploit the land more intensively, and the growing orientation toward market crops, forced more land out of production, which in turn greatly reduced the pressure on the remaining area. Agronomists suggested new methods, including more

careful plowing, snow retention measures, and complex crop rotations, but the imperial administration was legally bound by the 1835 agreement with the Cossacks to not interfere with their preferred methods of management. Education was the best alternative, but as was true with afforestation, the imperial administration chose to route the efforts through an intermediary body with its own resources and its own support base—as well as its own economic prerogatives. The railroad sponsored efforts to increase the agricultural acumen of the citizens and reverse these trends, but the method of delivery ultimately undercut the conservationist message.⁵⁸

- 20 In this case, the state worked through the Don Agricultural Society, a voluntary and private association of noble landowners and industrialists, chartered in 1888 by the Ministry of the Army, to formulate prescriptions and improve agricultural production and profitability in the south.⁵⁹ By 1914 there were thirty-eight branches throughout the Russian south, and the largest, centered on Rostov, had 116 members and published its own journal.⁶⁰ The Agricultural Society was in its own right an important, indirect conduit for conservationist activity, since it maintained staffs of agronomists, agricultural economists and educators. But because a significant part of the Society's budget came in fact from the Imperial Department of State Property, the Society was essentially a vehicle for state efforts, albeit one with its own priorities. The society applied for government approval for specific projects, which were most often approved. Indeed, the Society even requested reimbursement from the government when its agronomists on staff traveled between the society's experimental stations.⁶¹ By 1917, the Society received almost 60,000 rubles a year from the imperial treasury, much more than half its annual budget. The Agricultural Society used these funds to administer on the state's behalf an enormous agronomical infrastructure: an extensive network of experimental fields, a seed inspection station, seventy seed production centers, a meteorological department, a model farm for silk and silkworm production, a research center for technical and medicinal plants, a research center for the botanical study of wetland meadows, a center for visual aids, a technical school for repair of agricultural implements, a wineries laboratory, a beekeeping research station, a vegetable packing factory, and a correspondence school for agricultural education.⁶² The society received specific approval for all of these projects, so the government explicitly or implicitly agreed with the need for all of them; yet the Russian government preferred to employ a private institution to oversee their implementation.
- 21 In 1913, the administration of the Vladikavkaz railroad first contacted the Don Agricultural Society to inquire about the possibility of creating a traveling agricultural exposition and education center and asked for assistance in creating the displays.⁶³ The project thus involved a semi-governmental body, and thus had at least tacit consent of the state, but the cost of the project was financed by the railroad, a private enterprise. The Russian *agronomicheskii poezd*, or "agrotrain" resembled the promotional trains operated by American railroad companies in the late nineteenth century, and indeed the inspiration for the train was the American version, but the goals differed subtly. Whereas the American trains sought to spur interest in land sales along the railroad, the Russian agrotrain did seek to improve agricultural methods, only so as to raise yields and increase freight traffic for the railroad.⁶⁴ The train consisted of between eleven and fourteen cars, six of which were museum cars with exhibits featuring improved agricultural methods, two cars which were organized as stores selling seeds and books, plus a car with an electric generator, offices, a cafeteria, and a sleeping car. Lectures were given at every

stop, where the train remained for a few days at a time. Sixty thousand people met the train in 1913, twenty thousand in 1914, more than forty-one thousand in 1915, and fifty-two thousand in 1916, when the train was discontinued because of the war, and was revived for a short time in the early 1920s.⁶⁵ According to its proponents, the train aimed to advance conservationism by “cultivating in the younger generation a love for nature and for knowledge, and inspire in them a desire for agronomical action among the backward mass of the population,” and at least 177,000 people participated in the attempt, but exhibits presented a mixed message.⁶⁶ Although the planning materials stressed the love of nature, by the time the exhibits reached the stations, the displays focused relentlessly on maximizing gross output, in line with the railroad’s hope of increased levies on freight, rather than ameliorating the worsening soil conditions. The railroads, then, directly undercut soil conservation efforts by encouraging the very practices that had produced increased erosion on the steppe in the first place.

Conclusion : Steppe forests in single file

- 22 The Russian government’s decision to rely upon semi-civil, semi-state agencies with primary duties far removed from conservationism to carry out agronomical improvements had both beneficial short-term effects on the conduct of conservation work in tsarist Russia, and ambivalent long-term effects upon subsequent environmental work in Russia. On the one hand, the Russian choice to work toward conservationism indirectly lent the efforts immediate prestige and stability, since they reached the average citizen through the auspices of a recognized and well-established external institution. Delegating responsibility to institutions with well-established chains of command obviated the need to mold the attitudes of subjects or rely upon their actions. The chosen vehicles were able to achieve moderate levels of success, well before most other countries had developed anything comparable. This is especially remarkable when contrasted with the somewhat traditional view, expressed by Lazar Volin, that the tsarist government had little interest in improving agronomical practices in the countryside; in fact, the tsarist government showed prescient interest in the problem of erosion, and acted on this interest.⁶⁷
- 23 On the other hand, conservation work was, from the very beginning, conceptualized and implemented with an inherent imperial logic, through a pre-existing hierarchy. It is noteworthy that both the railroad and the army share a connection with the “high modern project” of straight lines, schedules, and regularity, which at least in the case of afforestation, resulted in an inflexibility about methods. A number of environmental historians, as well as the political scientist James C. Scott, have condemned environmental initiatives that run roughshod over local conditions in pursuit of an idealized and modernized landscape.⁶⁸ Forest workers frequently complained about the inapplicability of their instructions to local conditions, but the militarized setting made departing from orders a form of insubordination. Beyond the problems that stemmed from inflexibility, centralized decision-making, and oversimplification, the decision to entrust conservationism to institutions with pre-existing priorities meant that the pre-existing priorities colored the new auxiliary efforts. In both the case of the army and the railroad, soil conservationism was linked with duty or profit rather than with the common or public good. Profit motives shaped the content of the agrotrain exhibits, which were oriented toward the increase of agricultural output first and toward

ecological sustainability only rhetorically. Doing so also reflected a tendency to “muddle through” rather than fashion thoroughgoing solutions regarding the public sphere; this is also reflected in the fact, noted by Catherine Evtuhov, that even “the notoriously centralized Russian state [...] had not by the end of the nineteenth century managed to execute [a] uniform and centrally-driven investigation of its territories.”⁶⁹ The Russian “agrarian question” eluded easy solution because, as was true for the soil conservation program, the problems required a refashioned relationship between state and society that the regime was simply not disposed to pursue. Both ecological degradation and rural traditionalism, as experts at the time recognized, had deep causes, rooted in economics, politics, and history. Only comprehensive reforms could hope to reverse the damage, but the tsarist government was not prepared to implement changes that altered the existing structures of power.

NOTES

1. This society maintained its own journal, *Imperatorskoe obshchestvo sel'skogo khoziaistva Iuzhnoi Rossii* [The imperial society of agriculture of Southern Russia], beginning in the 1820s, although its focus did not fall on public outreach.
2. For instance, a recent survey of Russian environmental history mentions the progress made by tsarist-era agronomists, but when discussing implementation, mentions only that Russia lacked an extension service like that found in the United States. See Paul Josephson, *An Environmental History of Russia* (New York : Cambridge University Press, 2013), 46.
3. Leslie Symons, *Russian Agriculture : A Geographic Survey* (New York : John Wiley & Sons, 1972), 294.
4. Dokuchaev, because of his position as founder of a soil classificatory system subsequently adopted around the world, features prominently in many histories of Russian science and has been the subject of numerous biographical studies. Dokuchaev's theoretical contributions figure prominently in works including (but not limited to) : L.A. Chebotareva, “Vasilii Vasil'evich Dokuchaev, 1846-1903 : Biograficheskii Ocherk [V.V. Dokuchaev, 1846-1903 : Biographical Essay]” in V.V. Dokuchaev, *Sochineniia* [Collected Works], 9 Vols. (M. – L. : Akademiia nauk, 1949-1961), ix, 49-153 ; I. Krupenikov and L. Krupenikov, *Vasilii Vasil'evich Dokuchaev* (M. : Molodaia gvardiia, 1950) ; S.V. Zonn, *Vasilii Vasil'evich Dokuchaev, 1846-1903* (M. : Nauka, 1991) ; I. Krupenikov and L. Krupenikov, *Puteshestviia i ekspeditsii V.V. Dokuchaeva* [The travels and expeditions of V.V. Dokuchaev] (M. : Gosudarstvennoe izdatel'stvo geograficheskoi literatury, 1949), 5-30 ; E.S. Kul'pin-Gubaidullin, “Vasilii Dokuchaev kak predtecha biosferno-kosmicheskogo istorizma : sud'ba uchenogo i sud'by Rossii [Vasilii Dokuchaev as precursor of biospheric-cosmic historicism : the fate of a scholar and the fate of Russia],” *Obshchestvennye nauki i sovremennost'* [Social science and the contemporary era], no. 2 (2010) : 109-110 ; Catherine Evtuhov, “The Roots of Dokuchaev's Scientific Contributions : Cadastral Soil Mapping and Agro-Environmental Issues,” in B.P. Warkentin, ed., *Footprints in the Soil : People and Ideas in Soil History* (Amsterdam : Elsevier, 2006) ; David Moon, “The Environmental History of the Russian Steppes : Vasilii Dokuchaev and the Harvest Failure of 1891,” *Transactions of the Royal Historical Society*, 6th series, 15 (2005) : 149-174 ; Denis J.B. Shaw and Jonathan D. Oldfield, “Landscape Science : A Russian Geographical Tradition,” *Annals of the Association of American Geography*, 97 (2007) :

111-126 ; V.A. Bushakov and N.E. Drogobich, "O proiskhozhdenii landshaftnogo termina 'step' [About the origins of the landscape term "steppe"]" in A.A. Chibilev, ed., *Stepi Severnoi Evrazii : étalonné stepnye landshafty* [The steppe of Northern Eurasia : models of the steppe landscape] (Orenburg, Russia : Gazprompechat', 2003) ; Loren Graham, *Science in Russia and the Soviet Union* (New York : Cambridge University Press, 1993).

5. David Moon, *The Plough that Broke the Steppes* (Oxford : Oxford University Press, 2013).

6. Dokuchaev actually held a rather moderate position in the debate about anthropogenic ecological disturbance on the Russian steppe. Some observers, such as Ivan Palimpsestov, went much farther than Dokuchaev ever dared, and argued that the disturbances to the steppe environment had not only dried the land, but had changed the steppe climate. This point of view, although at the extreme end of the debate's spectrum at the time, received official support in a state investigation led by the Valuev Commission in 1873. See Moon, *The Plough that Broke the Steppes*, 122.

7. The best evidence from current palynological analyses suggests that forests were not widespread on the steppe in the centuries before Russian colonization, but even in the nineteenth century, many analysts suspected that perceptions of vegetative changes were essentially a form of nostalgia. Maria Loskutova goes so far as to contend that no reputable forester took the idea seriously in the nineteenth century, Moon's claims notwithstanding. See Marina Loskutova and Anastasia Fedotova, *Stanovlenie prikladnykh biologicheskikh issledovaniy v Rossii : vzaimodeistvie nauki i praktiki v XIX – nachale XX vv.* [The establishment of applied biological research in Russia : The interaction of science and practice in the 19th and the beginning of the 20th centuries] (SPb. : Nestor-Istoriia, 2014), 7-40.

8. As both Loren Graham and Alexander Vucinich have noted, the influence of the German example in the development of Russian science can scarcely be overestimated. For just one example related to biological science, see Loren Graham, *Science in Russia and the Soviet Union : A Short History* (New York : Cambridge University Press, 1993), 237.

9. Agricultural journals of the late imperial period are filled with articles by frustrated agronomists and confused farmers, lamenting the failure of agronomical methods to penetrate the peasant consciousness. To take but one example, a peasant named Alexander Nazarov wrote to the journal *Khoziaistvo na Donu* [Management on the Don] in 1907 that his village was surrounded by one thousand desiatins of sand, which previously were luxurious meadows, but that "the commune refuses to take any kind of measures." The editors of the journal suggested that he plant grapevines on these lands himself. A.I. Nazarov, "Voprosy A.I. Nazarova o peskakh [A.I. Nazarov's questions about sands]," *Khoziaistvo na Donu*, no. 9 (18 February 1907) : 120. Another peasant wrote in the same journal that he "heard that abroad, agricultural management goes differently than it does with us, and they grow twice as much grain as do we, but as for who is to blame for this, I do not know." Vikhlantsev, "Pis'mo podpischika Vikhlantseva Oblastnomu Agronomu o nuzhdakh khoziaistva [The letter of subscriber Vikhlantsev to the Oblast Agronomist about the needs of management]," *Khoziaistvo na Donu* 14 (1 April 1907) : 214.

10. See N. Sredinskii, "Kratkii istoricheskii ocherk lesorazvedeniia v iuzhno-russkikh stepiakh [A short historical essay about forest cultivation in southern Russian steppes]," *Lesnoi zhurnal* [Forest journal], no. 17 (1887), 741 ; N.T. Mirov, "Two Centuries of Afforestation and Shelterbelt Planting on the Russian Steppes," *Journal of Forestry* 33 (1935) : 971-973 ; Peter Rostankowski, "Transformation of Nature in the Soviet Union : Proposals, Plans and Reality," *Soviet Geography*, no. 6 (June 1982) : 380-389 ; Stephen Brain, *Song of the Forest* (Pittsburgh, PA : University of Pittsburgh Press, 2011), 142-167.

11. George Yaney, *The Urge to Mobilize* (Urbana, Chicago, London : University of Illinois Press, 1982). David Macey's *Government and Peasant in Russia, 1861-1906 : The Prehistory of the Stolypin Reforms* (DeKalb, IL : Northern Illinois University Press, 1986) also visits this theme. Deserving mention here is also Alexander Gerschenkron, "Russian Agrarian Policies and

Industrialization, 1861-1917,” in *Continuity in History and Other Essays* (Cambridge : Harvard University Press, 1968), 140-256.

12. Gerschenkron, “Russian Agrarian Policies and Industrialization, 1861-1917,” 5.

13. Yanni Kotsonis, *Making Peasants Backward : Agricultural Cooperatives and the Agrarian Question in Russia, 1861-1914* (New York : St. Martin’s, 1999).

14. Judith Pallot, *Land Reform in Russia, 1906-1917 : Peasant Responses to Stolypin’s Project of Rural Transformation* (Oxford, Eng. : Clarendon Press, 1999).

15. David Kerans, *Mind and Labor on the Farm in Black Earth Russia, 1861-1914* (Budapest : Central European Press, 2001), 132.

16. Ol’ga Elina, *Ot tsarskikh sadov do sovetskikh polei : Istoriia sel’skokhoziaistvennykh opytnykh uchrezhdenii XVIII-20-e gody XX v.* [From tsarist gardens to soviet fields : The history of agricultural experimental institutions from the eighteenth century to the 1920s], (M. : Egmont Russia, 2008).

17. Ilya Gerasimov, *Modernism and Public Reform in Late Imperial Russia : Rural Professionals and Self-Organization, 1905-30* (New York : Palgrave Macmillan, 2009).

18. Ekaterina Pravilova, *A Public Empire : Property and the Quest for the Common Good in Imperial Russia* (Princeton, NJ : Princeton University Press, 2014).

19. Pravilova, *A Public Empire*, 16.

20. Pravilova, *A Public Empire*, 79. Pravilova also writes that the Russian state “proved to be very reluctant” in using its power to the fullest, *ibid.*, 93.

21. Pravilova, *A Public Empire*, 270-271.

22. *Polnoe sobranie zakonov Rossiiskoi imperii* [The full collection of the laws of the Russian Empire], 2, x (No. 8163, 26 May 1835), article 36, 78 ; article 46, 88 ; articles 209-17.

23. GARO (Gosudarstvennyi archiv Rostovskoi oblasti – State Archive of Rostov Oblast) f. 301, op. 27, d. 5, l. 4.

24. For works that discuss the relationship between the Russian state and the Cossack Host include Shane O’Rourke, *Warriors and Peasants : The Don Cossacks in Late Imperial Russia* (New York : St. Martin’s Press, 2000) ; Peter Holquist, “From Estate to Ethnos : The Changing Nature of Cossack Identity in the Twentieth Century,” in Nurit Schlieffman, ed., *Russia at a Crossroads ? Historical Memory and Political Practice* (Portland OR : Frank Cass, 1998) : 89-123 ; Thomas Barrett, *At the Edge of Empire : The Terek Cossacks and the North Caucasus Frontier, 1700-1860* (Boulder, CO : Westview Press, 1999) ; Brian J. Boeck, *Imperial Boundaries : Cossack Communities and Empire-Building in the Age of Peter the Great* (Cambridge : Cambridge University Press, 2009) ; Michael Khodarkovsky, *Russia’s Steppe Frontier : The Making of a Colonial Empire, 1500-1800* (Bloomington, IN : University of Indiana Press, 2002)

25. A.A. Pushkarenko, G.P. Dolzhenko, and Ia.A. Perekhodov, *Okhrana prirody v oblasti voiska donskogo (vtoraia polovina XIX-nachalo XX v.)* [The protection of nature in the Don military oblast’ (the second half of the 19th century to the beginning of the 20th century)] (Rostov-on-Don : “Terra”, 2000), 38.

26. GARO f. 301, op. 27, d. 41, l. 4.

27. Even in the case of the Stolypin reforms, which represent the most thoroughgoing tsarist attempt to remake agricultural patterns, the Russian state concentrated on matters of external organization rather than management practices, and generally shied away from specifying agronomical techniques. See Yaney, *The Urge to Mobilize* ; Pallot, *Land Reform in Russia, 1906-1917* ; David Macey, *Government and Peasant* ; Richard Hennessey, *The Agrarian Question in Russia 1905-1907 : The Inception of the Stolypin Reform* (Giessen : Wilhelm Schmitz Verlag, 1977) ; and Corinne Gaudin, “‘No Place To Lay My Head’ : Marginalization and the Right to Land during the Stolypin Reforms,” *Slavic Review*, 57, 4 (Winter 1998) : 747-773.

28. V.V. Morachevskii, *Agromicheskaiia pomoshch’ v Rossii* [Agronomical aid in Russia] (SPb. : Izdatel’stvo Departmenta zemledeliia, 1914), 74-80.

29. Lazar Volin reports that such important policymakers as Minister of Interior Pyotr Durnovo and Minister of Finance Ivan Vyshnegradskii “opposed the idea of the rumored creation of a ministry of agriculture and even ridiculed the idea.” See Lazar Volin, *A Century of Russian Agriculture* (Cambridge, MA : Harvard University Press, 1970), 66.
30. Ihor Stebelsky, “Agricultural Development and Soil Degradation,” in Fred Singleton, ed., *Environmental Problems in the Soviet Union & Eastern Europe* (London – Boulder : Lynne Rienner Publishers, 1987), 76. Although the Ministry of Agriculture theoretically made agricultural education possible, the Ministry, in the words of David Kerans, “had no local organs” and “was so pitifully funded that it could not even dream of supporting any agronomic aid programs.” See Kerans, *Mind and Labor*, 391.
31. GARO, f. 301, op. 27, d. 103, l. 170.
32. G.I. Red’ko and N.G. Red’ko, *Istoriia lesnogo khoziaistva Rossii* [The history of forest management in Russia] (SPb. – M. : MGUL, 2002), 153.
33. GARO, f. 301, op. 27, d. 103, l. 4, 83.
34. Pushkarenko, et al., *Okhrana prirody v oblasti voiska donskogo*, 42-43.
35. GARO, f. 301, op. 27, d. 41, l. 90.
36. Pushkarenko, et al., *Okhrana prirody v oblasti voiska donskogo*, 45.
37. Pushkarenko, et al., *Okhrana prirody v oblasti voiska donskogo*, 98 ; GARO, f. 44, op. 1, d. 1, l. 10.
38. GARO, f. 301, op. 27, d. 55, l. 10-35.
39. GARO, f. 301, op. 27, d. 41, l. 97.
40. The arshin is an old Russian unit of measurement equal to 71 centimeters.
41. GARO, f. 301, op. 27, d. 41, l. 1590.
42. GARO, f. 301, op. 27, d. 158, l. 1.
43. GARO, f. 301, op. 27, d. 259, l. 3.
44. GARO, f. 301, op. 1, d. 531, l. 62-63.
45. GARO, f. 301, op. 27, d. 41, l. 40. The desiatin, like the verst, is an obsolete Russian unit of measurement almost equal in size to its modern metric equivalent. A desiatin is just a bit larger than a hectare, and a verst closely approximates a kilometer. There were five Cossack stations in Ust’-Medveditskii okrug, two in Khoperskii okrug, two in Donetskii okrug, and one in Miusskii okrug.
46. GARO, f. 301, op. 27, d. 81, l. 1.
47. GARO, f. 301 op. 1, d. 3164, l. 83 ; f. 301, op. 1 d. 3276, l. 1000 ; f. 301, op. 1, d. 3510, l. 91-93. It is very important to note that these gains were more than offset by the aggressive deforestation on the lands privately controlled by the soldiers. A commission established in 1907 to study the reasons for deforestation in the Russian south charged that “the destruction of the station forests is an unfortunate fact, which no one can doubt,” and that the forest “is being destroyed without remorse, without compassion, and mainly, without a discussion about the consequences of this pitiable phenomenon.” It was calculated that the Cossacks had cut more than 99,000 desiatins of forest since the organization of the region in 1835.
48. N.K. Genko, *Razvedenie lesa i ustroistvo vodosbornykh plotin na udel’nykh stepiakh* [The cultivation of forest and organization of drainage dams on the demesial steppe] (SPb., 1896), 13-15.
49. Moon, *The Plough That Broke The Steppes*, 194.
50. Hugh Bennett, *Soil Conservation* (New York – London : McGraw-Hill Book Company, 1939), 906-907. See also J.Y. Morris, “Soil Conservation Practices in France,” *New Zealand Journal of Forestry*, VII, 2 (1955) : 12-25, and *ibid.*, Part II, VII, 3 (1955) : 87-95.
51. The Soviets maintained their belief that afforestation improved agricultural yields until the fall of the USSR, and produced statistics showing the advantage gained. See Stephen Brain, “The

- Great Stalin Plan for the Transformation of Nature,” *Environmental History*, 15, 4 (October 2010), 24.
52. Pinchot Papers, Library of Congress, Box 715, “Notes taken by Mr. Pinchot on his trip through Russia and Siberia,” p. 49-61.
53. Pushkarenko, et al., *Okhrana prirody v oblasti voiska donskogo*, 27.
54. GARO, f. 26, op. 1, d. 248, l. 3.
55. GARO, f. 1902, op. 2, d. 18, l. 3.
56. Pushkarenko, et al., *Okhrana prirody v oblasti voiska donskogo*, 60.
57. A. Samokhin, “Tekushchiia zadachi melioratsii [The present tasks of amelioration],” *Severo-Kavkazskii Biulleten’* [The North Caucasus Bulletin], no. 1-2 (January-February 1917), 62.
58. GARO, f. 521, op. 1, d. 2, l. 3.
59. GARO, f. 79, op. 1, d. 9, l. 1.
60. GARO, f. 301, op. 27, d. 103, l. 8.
61. GARO, f. 79, op. 1, d. 7, l. 2.
62. GARO, f. 1902, op. 2, d. 22, l. 25.
63. “Agromicheskii poezd KOPS’a [The agronomical train of KOPS],” *Iugo-Vostok* [The Southeast], no. 2-3 (February 1923), 208.
64. “K rabote agromicheskogo poezda KOPS’a [On the work of the agronomical train KOPS],” *Iugo-Vostok*, no. 5-6 (May-June, 1923), 77.
65. GARO, f. 1902, op. 2, d. 18, l. 3.
66. “K rabote,” 88.
67. Volin, *A Century of Russian Agriculture*, 66.
68. See James Scott, *Seeing Like a State : How Certain Schemes to improve the Human Condition have failed* (New Haven : Yale University Press, 1999). Fernando Coronil, in contrast, argued that Scott’s framework was too simple, and contended instead that “states embody both the abstract logic Scott associates with high modernism and also the practical knowledge he identifies with *metis* [practical knowledge].” See Fernando Coronil, “Smelling Like a Market,” *American Historical Review*, 106, 1 (February 2001) : 127.
69. Evtuhov, “The Roots of Dokuchaev’s Scientific Contributions...,” 131.

ABSTRACTS

A deep suspicion haunted Russian agronomists throughout the nineteenth century, and well into the twentieth: agriculture on the steppe would never be sustainable until farmers learned to restore the balance of nature in the Russian south. The region appeared to offer agricultural plenty if only the damage caused by thoughtless exploitation could be repaired. But scientists did not agree about the best methods for reestablishing the balance, and the one measure that gained state acceptance—afforestation—was routed through the Cossack Army and the Vladikavkaz railroad, agencies with other, higher priorities. The state’s decision to remain aloof from the peasantry with the soil conservation initiative ensured that the gap between educated society and the rural citizenry remained deep and wide.

Tout au long du XIX^e et assez avant dans le XX^e siècle, les agronomes russes furent tourmentés par un doute profond : l’exploitation de la steppe ne deviendrait durable que lorsque les exploitants agricoles sauraient comment rétablir l’équilibre entre les écosystèmes dans le sud russe. La

région semblait riche en possibilités sur le plan agricole si seulement les dommages causés par une exploitation irréfléchie pouvaient être réparés. Mais les scientifiques n'étaient pas d'accord sur les meilleures méthodes à adopter pour rétablir cet équilibre. La reforestation fut la seule des mesures à recueillir l'approbation de l'État et sa mise en œuvre fut confiée à l'armée cosaque et aux chemins de fer de Vladikavkaz, qui avaient des priorités plus importantes. La décision de l'État de rester distant de la paysannerie dans le cadre de l'initiative de la conservation des sols ne fit que maintenir l'existence du fossé, large et profond, qui séparait la société éduquée de la population rurale.

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