

Roadlessness and the ‘path to communism’

Building roads and highways in Stalinist Russia

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Dorógi dórogi, a bezdorozh'e—dorozhe, ‘Roads are expensive, but roadlessness is more expensive.’ [Russian popular saying of unknown origin]

U Rusi dve bedy—duraki i dorogi, ‘Russia suffers from two curses—fools and roads.’ [Russian popular saying often attributed to Nikolai Gogol]

One early morning in July 1929 Valerian Osinskii set out from Moscow’s Red Square in a Model A Ford accompanied by three other cars. An erstwhile Left Communist who subsequently held several important positions in the state’s financial, statistical, and agricultural apparatuses, Osinskii was not merely out for a summer jaunt. As one of the founders of Avtodor (the voluntary Society for the Promotion of Automobilmism and Road Improvement, formed in 1927) and editor of the organisation’s bi-monthly journal he had assigned himself the task of testing four foreign models to determine which best stood up to the rigours of Soviet roads. The several thousand kilometre journey through Tula, Lipetsk, and Voronezh provinces proved a more than adequate test.¹ ‘It is simply amazing,’ Osinskii noted, ‘how people can live and work inasmuch as movement on these “roads” is simply impossible.’ So poorly maintained were Voronezh’s provincial roads that they provoked ‘wonder whether someone fearing the invasion of an enemy intentionally spoiled [them] to make movement more difficult. . . . In truth,’ Osinskii wrote, ‘our attitude toward roads is one of the clearest manifestations of the survival of barbarism,’ which he likened to ‘Asiaticness, indolence, and idleness’.²

Osinskii did more than simply lament the condition of Soviet roads. He sought to present visions of a more civilised future. In July 1927 he had written a series of articles for *Pravda* in which he called for ‘Every worker and peasant in a car within not more than ten to fifteen years!’—this at a time when the number of motor vehicles (trucks as well as cars) throughout the entire country came to less than 20,000 and Soviet factories were

producing no more than a few hundred each year.³ In November 1928, half a year before undertaking the test run to Voronezh, he published an account of what such a trip would be like by the twentieth anniversary of the October revolution in November 1937. Transmitted back from the future by H. G. Wells's time machine, the letter described the entire highway to Voronezh as paved with asphalt so smooth that the only sound heard was the whoosh of tyres.⁴ Of course, throughout the Soviet era many people fantasised about a radiant future replete with symbols of technological modernity. But dreams of such a utopia and the projects to realise them were especially profuse after Stalin launched in 1928 the twin drives to collectivise agriculture and industrialise the country.

This article enquires into the fate of Osinskii's dream, and more generally the role of roads and their construction in a society that putatively was travelling along the 'path to communism' at a rapid pace under Stalin. It seeks to determine why the concerted campaign to overcome roadlessness, claimed by its proponents as a precondition for successful collectivisation and industrialisation, took the forms it did and what degree of success resulted therefrom. How did motorisation (automobilism by another name) compare to other modes of transport, and how did the state's strict control over the production and distribution of automobiles affect road improvement? More generally, what were the social inputs and consequences of the methods of road construction adopted by the state? In this article I treat road construction as a function of Stalinist modernisation strategy and its limitations, arguing that the very means to achieve a socialist form of modernity retarded the development of a modern system of roads.

Roads, roubles, and *rasputitsa*

One of imperial Russia's legacies to the Soviet Union was its network of highways (known in Russian as *shosse*, from the French word *chaussée*) that connected the major cities of the European part of the empire. Serving primarily military and postal functions, these thoroughfares tended to be straight, lined with trees, and occasionally hard-surfaced. The Ministry of Ways and Communications bore responsibility for maintaining them and, by pre-automobile standards, seemed adequate to the task. *Zemstvos*, the provincial and local governmental institutions created by the Great Reforms of the 1860s, administered local roads. As of 1913—a standard benchmark for comparisons between the tsarist and Soviet states—the *zemstvos* were spending an average of 6–7 per cent of their budgets on local road construction, with some devoting twice that proportion.

Like many other state and governmental functions, highway and local road maintenance diminished during World War I and the subsequent years

of revolution and civil war. The fledgling Soviet government's Glavkomtrud (an acronym for Main Committee on Work Duty) did attempt to press into service hundreds of thousands of people to clear roads of snow and other debris, repair bridges, and do limited maintenance so that food and fuel could be delivered. But, as would occur under Stalin, peasants evaded in droves the requirement to perform unremunerated labour.⁵ With the re-establishment of commerce in the early 1920s the incentive to improve roads increased but not the means to perform the work. Average expenditure on roads by rural soviets during 1924–27 amounted to less than 1 per cent of their budgets, which generally were smaller than the budgets of the *zemstvos* before the revolution. Roads of 'state significance' fared no better. Whereas in 1913 the Ministry of Ways and Communications assigned 557 roubles per kilometre for repair and maintenance on highways under its administration, the amount allocated by its Soviet equivalent in the 1925–26 fiscal year was 350 roubles.⁶

The meagreness of the allocations reflected the low priority the Soviet state gave to roads compared to railroads. A mere 8 million roubles in 1924–25, total state expenditures on roads throughout the Soviet Union grew to 24 million in 1927–28 and 55 million by 1929–30. Local and republic governments chipped in additional funds for local road construction and repair, but, even then, gross investment did not come close to what the state spent on railroads. This amounted to 715 million roubles in 1927–28 and a planned 927 million for 1928–29.⁷ These comparisons of expenditures are only one measure, and an inexact one at that. No less indicative of state priorities and the Communist Party's ideological orientation that helped determine them was the tremendous propaganda campaign surrounding the building of the Turkestan–Siberian (TurkSib) railroad between 1927 and 1931, and the frequency with which locomotives, tractors, and airplanes appeared as icons of Soviet socialist construction during the First Five Year Plan period (1928–32).⁸ Road-dependent vehicles—even the solidly proletarian trucks that would outnumber passenger cars for decades to come—rarely served in this capacity. To be sure, party propagandists ceaselessly invoked roads in the metaphorical sense of the 'path to communism', but the real roads that garnered resources and attention tended to run along rails.

The paucity of decent roads figured in debates about the future Soviet automobile industry provoked by Osinskii's articles in *Pravda*. Osinskii himself had categorically rejected the argument that before the Soviet Union could build automobiles in large numbers it needed to improve roads. Cars improved roads, he asserted, citing the United States as the prime example, because 'when the rural dweller receives a motor vehicle, he receives the possibility and desire to spend his money and labour on improving roads'. 'There is no point in being intimidated by a lack of roads,' agreed a participant in one of the two debates sponsored by Avtodor. 'Automobiles will create the demand for roads and good roads will create the demand for



Figure 1 The Soviet Union, c. 1936

automobiles, as they have in the United States.' Some expressed scepticism or impatience, but advocates of pushing ahead with the mass production of autos won the day.⁹ When *Avtodor's* journal began publication in April 1928 it contained an article demonstrating that, because of the minuscule number of vehicles in the country, the Soviet Union's roads were among the emptiest in the world.¹⁰

Osinskii and his supporters in *Avtodor* did not intend to delay the improvement of roads. The very name of the organisation (and an entire department within it devoted to roads) bore witness to such a commitment. Yet, if Russia's roads were so empty, why hurry? The strategy of cars improving roads presupposed masses of vehicles rolling off assembly lines, but only in May 1929 did the Soviet government sign an agreement with the Ford Motor Company to obtain Ford's Model A technology. The resultant Gor'kii Automobile Factory (GAZ) didn't start mass production until the middle of 1932, and not until 1937 would the entire Soviet automotive industry reach the 130,000 units expected from GAZ alone.¹¹

But did *Avtodor* matter? Like many things in the Soviet Union, voluntary organisations were not what they seemed. I refer not to the nature of their membership but to the reasons for their existence. Societies for automobilism and road improvement, literacy, support of the chemicals and defence industries, 'godlessness' and other causes deemed worthy by party leaders emerged in the 1920s as ways of popularising them without bearing infrastructural costs. Indeed, soaking up additional funds from the 'public' through a variety of campaigns and appeals comprised one of the primary

activities of these organisations. Avtodor attracted a heterogeneous mixture of technical specialists, professional drivers, enthusiasts from pre-existing auto clubs, and others who may have been genuinely interested or, as often is the case, merely wanted to pad their résumés.¹² In the case of roads, it functioned as lobbyist, recruiter, and fund raiser for the Central Administration of Highways and Unpaved Roads (in Russian, Tsudortrans)—a bureaucratic institution with corresponding 'dortrans' units at lower administrative levels formed in November 1928 and reporting to the Commissariat of Transport.

Avtodor and Tsudortrans faced a truly daunting task. In North America and to a lesser extent Western Europe burgeoning numbers of automobiles (and the corresponding expansion of both motorised trucking and auto tourism) created an urgent need for road construction and improvement, a need paid for by the combination of petrol taxes and state aid. In the United States, where civil engineers effectively gained control of the federal aid highway system, 1921 marked the beginning of the 'golden age of highway building'.¹³ Nothing of the sort could occur in the Soviet Union. Aside from the relative lack of automobiles, the Communist Party under Stalin ruthlessly suppressed the technocratic tendencies among Soviet engineers that Pavel Palchinsky (who according to his biographer 'developed his own program for industrialising the Soviet Union') had exhibited most boldly.¹⁴

Prodigious road building in the capitalist world expanded the relative lag or 'backwardness' of the Soviet Union in the 1920s. At the end of the decade a study commissioned by Tsudortrans found that for every 10,000 persons the Soviet Union had 1.7 km of roads compared to 39.5 km in Germany, 150 km in France, and a colossal 450 km in the United States. The total length of improved roads in the country amounted to less than half of Sweden's, about a quarter of Italy's and no more than a tenth of Britain's. What was worse, the report identified nearly three-quarters of the Soviet roads as being in 'unsatisfactory condition'.¹⁵ Anecdotal accounts by the few Westerners who ventured outside major cities in automobiles at this time echo Osinskii's lamentations about the roads of Voronezh. George S. Counts, who drove a Ford across Soviet Russia from Leningrad to Tuapse (on the Black Sea) in the summer and early autumn of 1929, described the roads he encountered as 'of a simple rural civilisation . . . [that] had little need for an elaborate system of roads'. At least north of Moscow, even the 'big roads' were 'fashioned by the hand of nature and carved by the wheels of the waggons of peasants'. Three years later, in August 1932, two women from Atlanta, Georgia, journeyed from Warsaw to Tbilisi over roads that 'were practically impassable'. What role the condition of the roads played in their reported loss of 'sympathy with . . . communism as a solution or a panacea for world political and social conditions' is not clear.¹⁶

Had Counts or the Atlanta women waited a few more weeks to make their respective journeys they probably would not have been able

to travel at all because of *rasputitsa*. The term refers both to the condition of impassability and the times of the year when it is prevalent. During the autumn rains, and again when massive amounts of snow and ice thawed in the spring, the unpaved roads of a good part of the clay-laden Eurasian plain became a quagmire of muddiness. A subject for landscape artists and military strategists alike, *rasputitsa* illustrated—and to a striking degree still exemplifies—what political scientist Allen C. Lynch calls Russia’s ‘illiberal geography’.¹⁷ For state officials in the ‘dortrans’ hierarchy, for Avtodor’s road department, and for party activists who threw themselves into the campaign to build roads during the great industrialisation and collectivisation drives, it represented a condition they called ‘roadlessness’.

Overcoming roadlessness ‘from below’

Money allocated for roads in the federal budget went exclusively toward those categorised as having ‘state significance’ or national importance. As of 1933 these roads comprised only some 250,000 of an estimated total of 1.4 million km of roads.¹⁸ The vast majority of roads, therefore, serving the vast majority of the population, depended on local resources. What in terms of resources the local population lacked financially it possessed in an abundance of labour, or, rather, its capacity to work. Around this resource the Soviet state organised a system of road construction and maintenance. Superseding a resolution of August 1925 that had asserted the need for organising road maintenance but did not mandate the mechanism, a decree issued in November 1928 by the Central Executive Committee of the Soviets and the Council of People’s Commissars required up to six days a year of labour devoted to this purpose. The decree obligated all able-bodied adults residing in the countryside—excluding industrial workers, employees, and students—for service. It authorised district and county executive committees to determine the total amount of service required from each rural settlement. Individuals’ contributions could be adjusted on the basis of whether they provided working animals and—characteristic of the class animus of the time—according to the ‘category of the population (traders, kulaks, middle peasants, poor peasants, etc.)’ to which they belonged. The law also stipulated that upon petition a monetary payment not to exceed 20 per cent of the annual agricultural or income tax could be substituted for the labour service.¹⁹

Although couched in terms of ‘labour participation’, and full of caveats and provisions for opting out, this rudimentary system, according to one historian, was ‘reminiscent of the *corvée*, or labour obligation, that landowners, the church, and state required of their serfs prior to 1861’.²⁰ One need not go back quite so far for analogies, for labour obligations did not disappear with the emancipation of the serfs. Dorothy Atkinson, a historian of the *zemstvos*, notes that, even though they ‘were generally viewed as discriminatory and were unpopular with the peasantry’, natural obligations

persisted in some parts of the country until the twentieth century. She cites road work as 'the most important of the natural duties' that also included quartering soldiers and transporting officials.²¹ After the October revolution, Soviet authorities imposed labour obligations to carry out a variety of functions, especially (as already noted) during the civil war, when rampant inflation made monetary payments impractical. Here and there local road maintenance may have continued uninterrupted on this basis throughout the 1920s.

But just as superordinate authorities historically had extracted this resource from the peasants, so in the interests of familial and collective survival peasants were capable of exploiting themselves in this way. The popular saying cited as first of the epigraphs to this article may have expressed just this point—that, although burdensome, the building and maintaining of roads warded off general penury. Nor did this practice make Russian and other peasants in the Soviet Union unique. As Holland Hunter pointed out in his classic study of Soviet transport, 'such local road maintenance obligations have of course been important in United States rural areas down to quite recent times'.²² The trick for Soviet authorities involved in mobilising peasants for road work was, then, how to persuade them that their own best interests were being served.

The donation of six days of labour (less if one brought one's horse) per year to fix roads did not constitute an overwhelming burden in itself. But the temporal proximity of the decree to the onset of the vastly unpopular collectivisation drive, the fact that both measures ultimately emanated from the same source, and that often the same regional bodies bore responsibility for their implementation, weighed against compliance. At the height of collectivisation in 1930, while regional tribunals in Novosibirsk were prosecuting individuals for failing to fulfil their obligations, road construction officials pleaded with the district executive committees not to assign them to other tasks. At the same time, the highest governmental body in western Siberia—the praesidium of the region's executive committee—was warning subordinate officials that food shortages would not justify failure to fulfil the requisite road work. Peasants meanwhile resorted to substituting earth, stumps, and large rocks for stones in laying road beds in order to more quickly fulfil tasks assigned to them.²³

Elsewhere the situation appeared better. According to one Avtodor member, the Central Black Earth region gave more than 7 million labour days (the unit of labour accounting employed in collective farms) in 1931. This figure far surpassed the 4.19 million that the Leningrad region 'gave', but the latter also recorded 2 million horse days. No region, though, outdid the Chuvash Autonomous Republic. 'A hundred times!' screamed a newspaper headline referring to the republic's stupendous achievement of increasing the number of kilometres of improved roads by 100 times (1,000 per cent!) in the course of eighteen months. True, only 30 km of such roads existed to begin with, but the rate was accelerating. By 1 January 1931 the republic's peasants had improved 1,200 km of road and by August the figure

stood at nearly 3,500 km.²⁴ For all of 1931 the republic fulfilled its road work plan by 113 per cent, thanks in no small part to its Avtodor branch, which served as a model for the entire organisation, ‘the yardstick by which all other rural efforts . . . were measured’.²⁵ For its outstanding work in organising labour participation in 1932 the Chuvash Avtodor received two tractors and 15,000 roubles from the organisation’s central council.²⁶ In the process Avtodor helped to transform not only roads but lives too. Workers, students, and Young Pioneers reportedly came to take a look at the fine roads in their free time. They played the accordion and sang as they strolled along.²⁷

Yet, for all of this favourable publicity, the Chuvash republic’s actual accomplishments were more modest. The 1933 inventory of roads conducted by Tsudortrans cited a lower percentage of improved roads in that republic than in either the Leningrad, Sverdlovsk, or Gor’kii (formerly Nizhni Novgorod) regions, and well below the Georgian Soviet Socialist Republic, where over half the total length consisted of improved roads.²⁸ How could that be? For one thing, accuracy of reporting probably ranked near the top of the casualties from this—the most chaotic—period of Soviet history, and quite possibly the Chuvash authorities told better tales than their counterparts elsewhere. For another, no correlation necessarily existed between rates of compliance (showing up to fulfil labour obligations) and actual work performed. Finally, the definition of improvements (replacing dirt with gravel, or planks on a bridge; adding a ditch; building a fence) seems to have varied from one region to another. The stenographic report of the First All Union Road Conference that met in Moscow in May 1932 indicates just such a wide variety of meanings and standards.²⁹

Official data show that labour days devoted to road work nearly doubled between 1931 and 1934.³⁰ The increase may or may not have reflected reality—and on such things agnosticism is best—but already one can detect a replacement of natural obligations by monetary payment. According to a new decree of August 1931, ‘all available able-bodied labouring peasants, collectivised and non-collectivised, in the ages of eighteen to forty-five’ were obliged to ‘participate without pay in new road construction and repair of roads and installations six days per year’. But villagers who happened to be elsewhere engaged in seasonal work had to make a monetary contribution equal to not six but twelve days of analogous work.³¹ A subsequent measure from 1932 required local governments to devote ‘not less than 10 per cent’ of their budgets to assisting peasants in the performance of their obligation by the hiring of ‘technically skilled cadres’ and obtaining the necessary equipment and materials. Finally, a law of 3 March 1936 specified the times of the year (spring and fall, when free from agricultural tasks), the age range for women (eighteen to forty), and the radii within which collective and independent farmers could be assigned (15 km, instead of the 10 km mentioned in the 1931 law). It also suggested (point 5) ‘that it would be more advantageous to both the collective

farm and the state if, rather than requiring all members to perform road work, the collective farm instead formed standing brigades whose work would be calculated in the general plan of labour participation established for the collective'.³² This approach recommended itself to one Avtodor activist who complained at a joint conference with officials from Tsudortrans that 'some leaders of district executive committees and collective farm chairmen' dismissed the performance of the road work obligation with the comment 'Comrades, your roads can wait. I have my own roads in the district, and besides, I need to prepare for the harvest, haymaking, and so forth. I must do my own work.'³³

By 1937 the state had regularised the entire system of rural road maintenance by distributing elaborate forms with instructions for filling them out to district soviet executive committees and thence to their road departments.³⁴ Did peasants continue to drag their feet over fulfilling their road service obligations, as they did with so many other tasks imposed on them as collective farmers, or did they eventually come to regard road work as leading to tangible benefits? The evidence is slight and contradictory, but the proliferation of trucks on collective farms in the late 1930s—largely the result of the state's initiation of retail sales to farms that had fulfilled their procurement plans—quite possibly changed the equation for many peasants. In 1937 alone cotton farms in Central Asia obtained 2,000 such vehicles, those in the Tatar Autonomous Republic bought nearly 1,000, and the collectives of the Azov–Black Sea region acquired 1,460 trucks (and 23,000 bicycles). *Pravda* reported that Ukrainian farming collectives possessed 2,651 vehicles on 1 October 1936 but 9,356 on 1 August 1937. Several were demanding passenger cars. Especially as horses 'remained a deficit good throughout the 1930s', the availability of these vehicles for collective if not personal business. (Trucks may have provided an incentive to repair roads that previously was lacking.)³⁵ In this sense, then, cars may be said to have been responsible for improving the roads.

Building highways—imagined and real

On 10 May 1933 *Pravda* ran an article datelined Gor'kii and headlined 'Autostrada Moscow–Gor'kii'. It announced approval of plans for the 414 km highway that would be included among the year's priority ('shock') construction projects. Preparatory work on storage facilities for bitumen and for gravel and asphalt bases already had begun. The road, commissioned (though not funded) by Avtodor's Central Committee, would be a 'colossal enterprise' like no other in the country. What made it so was neither its length nor the natural obstacles it would have to surmount but rather its breadth. In order to accommodate sixteen lanes segregated for use by fast-moving passenger cars, trolley buses, freight-carrying motor vehicles, motor cycles, horse-drawn vehicles, bicycles, and pedestrians, it would be 150 m wide. The centre lanes would carry vehicles traveling at speeds up to 120 km an hour, while 'permanent greenery' would border the outer, more bucolic,

pedestrian lanes. The entire *strada* would be equipped with night lights, repair, filling, and recharging (for batteries) stations, as well as small hotels and cafeterias.³⁶

Someone must have sounded the alarm, for two days later *Pravda* carried a brief notice describing the project as a ‘complete fantasy’. It chastised Avtodor first for having commissioned the Leningrad Auto Road Institute (LADI) to design the *autostrada* rather than concerning itself with trying to make the existing roadway navigable, and then for seeking to force its construction through various state agencies. But Avtodor was not alone. Tsudortrans, the bureaucratic institution that administered the country’s road system, also got caught up in the fantasy and only as an afterthought had undertaken an economic assessment of the project—which showed it to be unnecessary.

Two years later, in 1935, the Soviet government abolished Avtodor, transferring its assets and responsibility for popularising automobilism to the auxiliary defence and sports establishments. The incident of the imaginary *autostrada* does not seem to have entered into the decision. Rather, the heightening of defence-mindedness occasioned by the increasingly threatening international situation best explains the organisation’s absorption within these surviving voluntary societies.³⁷ The same impetus was behind the decision of the Council of People’s Commissars to transfer Tsudortrans to the People’s Commissariat of Internal Affairs (NKVD) and then to ‘reorganise’ it into a Main Administration of Highways (Gushosdor).³⁸

That decision also facilitated the use in highway construction of an ever-growing ‘free’ labour source—prisoners in the NKVD-administered Gulag—that the NKVD already had drawn upon in the highly publicised construction of the White Sea–Baltic Canal (1932–34) as well as other projects.³⁹

Elements no less fantastic—though far more tragic—than Avtodor’s imagined *autostrada* entered into these administrative manoeuvres. Fantasy (or perhaps phantasmagoria) played its part in the accusations against former Tsudortrans officials and civil engineers arrested during the Great Purges of 1936–38. In the midst of these the engineer A. S. Kudriavtsev concocted an elaborate chain that linked the former director of Tsudortrans, Leonid Serebriakov, to ‘Industrial Party wreckers’ who had been in charge of road administration as long ago as 1924; to unnamed ‘anti-mechanisers’; and to a group of soil scientists whose textbooks ‘propagandised’ the utility of ground soil as a basic road surfacing material.⁴⁰ Kudriavtsev, who would go on to write several books on road construction after the Second World War, could not have invented these accusations without the co-operation—if not instigation—of the NKVD. The logic—so to speak—behind the execution of Serebriakov’s former assistant Stepan Perepëlkin was probably guilt by association, though, as in the case of other leading road administration personnel who suffered the same fate, he was accused of having participated in a counter-revolutionary plot.⁴¹

Fantasy of a different sort figured in the plans for highway construction emanating from the security apparatus. Even as it was destroying so many lives and careers the NKVD, the most powerful and feared institution within the Soviet government, also engaged in an orgy of building. The plans that NKVD boss Genrikh Iagoda and Georgii Blagonravov (Serebriakov's replacement as director of Tsudortrans) sent to Stalin in November 1935 quite literally provided the blueprint. Partaking of the same 'premature fixing of parameters and . . . gigantomania' that Paul Josephson identifies with the Soviet 'fascination and commitment to a technology of display', they also are reminiscent of other centrally planned social engineering projects that James Scott describes and denounces as characteristic of 'seeing like a state'.⁴² They called for earmarking 846 million roubles from the federal budget for 1936 alone to build three kinds of roads: broad, 20 m wide highways or main lines analogous to the straight-as-an-arrow railroads long favoured in Russia; strategic roads near the western and eastern borders of the country; and other roads of state significance.⁴³

The main component of the plans consisted of seven main lines, projected to cost 475 million roubles in 1936 and a total of 823 million at completion. Totalling roughly 3,700 km, they would link Moscow with Leningrad, Gor'kii, Kiev, Minsk, Kharkov, and Iaroslavl', and connect Kharkov to Rostov. The Moscow-centeredness of the schema was no less characteristic of its time than the prime justification for the enormous expenditure of state funds: the prospect, even likelihood, of a pan-European war, and therefore the necessity of strengthening the defence of the country via the rapid deployment of troops and equipment. Iagoda and Blagonravov gave the example of the Moscow–Minsk highway, which, so their report claimed, could support the movement of two entire infantry divisions in a single day.⁴⁴ The government approved two of the seven for immediate construction—the Moscow–Minsk and Moscow–Kiev highways—and placed Blagonravov in charge of logistical planning and budgeting for both projects. The two roads, the government's directive stated, would have 'immense significance for the economy and defence'.⁴⁵

The highways' rationale bore striking similarities with what the Soviets attributed to the Nazis' programme for building autobahns. After arguing that the 'German *autostradas*' were intended primarily for military use, an article in the journal *Za rulëm* (Behind the wheel) admitted that 'it would be a mistake to ignore the huge potential that the *autostradas* have for auto transport'. It also waxed eloquent about their 'exemplary maintenance, road signs, and safety features', all of which held 'great interest for our road construction'.⁴⁶ In at least two key respects, though—labour and design—the Soviet project deviated from the autobahns. Whereas the Nazis relied heavily on previously unemployed workers whom they organised in camps, the two camps (one near the city of Kaluga and the other in Viaz'ma, Smolensk region) that the NKVD set up for the express purpose of providing labour for the highways were part of the Gulag system. And while the autobahns derived their landscape aesthetics from the

undulating parkways of the eastern United States, the Soviet highways would, in the words of *Pravda*, 'have no . . . ravines to hinder the smooth flow of cars'. Poklonnaia gora (Kneeling Hill), on the western approaches to Moscow, 'will be moved a little to the side', *Pravda*'s report on the Minsk highway cheerfully continued, 'because the builders don't want to have to deal with hills'.⁴⁷

Both the autobahns and the Soviet projects had propagandistic value. As in Soviet literary luminaries' celebration of the White Sea–Baltic Canal construction, the NKVD again received accolades for giving convicts a chance to redeem themselves through their labour:

The men of the NKVD will apply not only their flaming tirelessness but their high degree of discipline, accuracy, and faith in the task. They will raise man from the muck and put him on his feet again, awakening in him the best human feelings, teaching him to labour. Thus, levelling or raising hills, the leaders of construction will 'straighten out' not only nature but man too.⁴⁸

In constructing the 830 km-long Moscow to Kiev highway the security forces would employ 'mathematical exactitude and iron precision characteristic of all the work of the NKVD, that authoritative "firm".' The road, scheduled for completion by the end of 1937, would resemble 'the best *autostradas* of Europe'.⁴⁹

But trouble lay ahead. Concerned about the highway's disruptive effects on populated areas, Gushosdor's engineers first altered the Moscow–Minsk route. Then they decided to build a parallel track to accommodate tractors, whose spiked wheels would have chewed up the highway's paving. They also proposed a scheme to solve the problem of livestock crossings—arched stone paths under the highway every 5 km—but this proved intolerably expensive. Eventually, in June 1938, the NKVD approved the revised plans for the 695 km road and stipulated completion by 1940.⁵⁰ Meanwhile the purges ground on, chewing up those who had been in charge of organising the labour of earlier victims. Blagonravov, Gushosdor's director, was arrested in May 1937. A few months later, P. A. Petrovich-Shteinpres, director of the Moscow–Minsk construction project and the Viaz'ma camp, lost his freedom. On 11 March 1938, three months after Blagonravov's execution, Veniamin P. Kniazev, assistant chief engineer of the Moscow–Minsk project, was arrested on charges of participating in a counter-revolutionary terrorist organisation. He was executed on 1 September along with several other former Gushosdor officials.⁵¹

Aside from the disruptions that such 'turnover' of leading cadres caused, highway construction suffered from a diversion of resources (including convict labour) to more urgent or prestigious projects such as the Moscow–Volga Canal. By February 1938 a party control commission was explaining the disappointing progress in terms of 'tolerance of scandalous defects and abuses' by 'enemies of the people' who over 'a long period had inserted

themselves into road organisations and did everything they could to impede construction'.⁵² How should we understand these accusations of 'defects and abuses'? The annals of the Great Purges are filled with all sorts of fantastical testimony extracted from those under arrest by investigators who themselves could not afford to err on the side of caution. The cases of the hapless Gushosdor officers undoubtedly involved their share of this sort of thing. This is not to deny, however, that abuses had occurred. Rare is the construction project anywhere that does not cut corners, skirt or violate safety rules, and engage in other questionable practices. A labour force consisting of largely unmotivated prisoners compounded the temptation to commit such abuses. What distinguished the two highway projects, therefore, was not that defects and abuses occurred but rather that they occurred in the midst of general, state terror.

Of the two, the Moscow–Minsk highway came closer to completion before the Nazi invasion. The Kaluga camp population seems to have peaked in mid-1938, when it numbered nearly 50,000; at least that number of workers and peasants, hired from the towns and villages on either side of the road, supplemented the convicts. By the time the NKVD suspended the project in March 1941 and reassigned workers to build air bases, they had removed millions of cubic metres of clay and peat-laden soil; laid down hundreds of thousands of tons of crushed stone, concrete, and asphalt; and erected 115 bridges and numerous other structures. Available records do not indicate the fatality rate.⁵³

Conclusion

The distance from Moscow to Voronezh is 461 km. In 1928 Valerian Osinskii projected himself into the future, dreaming that nine years later he would be traveling along an asphalt-covered highway linking the two cities. No such highway, however, figured in the 3,200 km of concrete or asphalt roads listed in official data for 1937, nor even among the more than 7,000 km for 1940.⁵⁴ As late as the summer of 1934, when Osinskii and several companions drove out to inspect harvest preparations, they discovered in fact that the road between Elets and Voronezh—covering a distance of nearly 100 km—no longer existed, even though it appeared on their map. It was, in the words of one of the travellers, 'a mere indicator of the direction of movement, to get one's bearings'.⁵⁵

One could argue that Osinskii should not have been disappointed, for the more than doubling of the distance of asphalted road within three years—to say nothing of an increase of somewhat smaller proportions in other hard-surfaced roads over the same period—represented a significant achievement. Or one could take the opposite position and, by pointing to the fourfold increase in the number of trucks between 1934 and 1938 (from 133,000 to 630,000), suggest that road improvement did not, after all, keep pace with automobile production.⁵⁶ In working through this narrative of Soviet Russian road conditions and construction up to the outbreak of the Great Patriotic

War I have tried to strike a balance between these two perspectives—taking into account on the one hand other priorities and the limited resources at the state's disposal and, on the other, the ideological component in the selection of priorities and the state's abominable treatment of those on whom it had relied to promote road construction and to build roads. Osinskii, for example, is a not unambiguous figure—he had participated fully in the rough-and-tumble of Communist Party in-fighting, after all—but there is something poignant nonetheless about his arrest on 13 October 1937, less than a month before the anniversary of the October revolution he had fantasised about.⁵⁷

This article has considered the construction and maintenance of rural roads of 'local' significance as well as major thoroughfares of state, Union importance. Holland Hunter has noted with respect to the former category that 'the persistence of Russian "roadlessness" may well reflect inadequate incentives for the rural population to build and maintain good roads'.⁵⁸ But if the path to communism could not be paved in the 1930s, it might at least have consisted of more than a rut made by the proverbial peasant cart. The problem was not only a lack of incentives, but that overcoming roadlessness in the countryside meant more tightly binding peasants to supervening state authority or, to put it another way, facilitating the extraction of more surplus from the villages already hard pressed to meet their other obligations in the context of the collectivisation of agriculture. The Stalinist state did not so much slight those who lived in the agricultural sector, to cite Hunter's formulation, as seek to tether them to its economy and culture. Peasants and local officials responded with massive absenteeism, a slack pace of work, and padding of numbers, all of which were familiar strategies for dealing with authorities. Toward the end of the decade the increased availability of trucks on collective farms provided something of an incentive, but it would not be until the arrival of mechanised equipment, the corresponding professionalisation of road-building crews, and a decree of 1959 effectively eliminating the legal inequality (in this respect) between rural and urban residents that roadlessness truly began to abate.

Highways and their construction engaged the transformative element of Communist ideology according to which the 'physical structures [that] took shape . . . forced human adaptation to their presence'.⁵⁹ Reliance on convict labour and assertions of its redemptive character compounded the narrative of the natural landscape's transformation, echoing the slogan from the First Five Year Plan years that 'we build the factory and the factory builds us'. Here too, aside from sheer physical survival, one is hard pressed to identify incentives for those doing the digging, hauling, and other manual tasks. For the state, highways had significance for reducing the costs of transport and improving military mobilisation, objectives that were hardly unique to the Soviet Union as war approached. But, beyond that, highways evoked alluring visions of an orderliness and 'integrativeness' that proved elusive under Stalin. Imaginative sinews binding together—and thereby strengthening—the state, their hasty and even haphazard construction in the immediate

pre-war years contributed to the deaths through arrest and execution of many loyal cadres entrusted with their completion.

Notes

- 1 N. Osinskii, 'Dve tysiachi kilometrov na avtomobile' [Two thousand kilometers in an automobile], *Za rulem* 15 (1929), 12. Osinskii also wrote an account for *Pravda* (16 July 1929) that appeared as well in a collection of his articles and speeches. See N. Osinskii, *Avtomobilizatsiia SSSR: stat'i, ocherki, rechi 1927–1929* [Automobilization [in the] USSR: articles, essays, speeches, 1927–1929] (Moscow, 1930), pp. 225–35. He used 'N' as a *nom de plume*. All translations from the Russian are by the author.
- 2 Osinskii, 'Dve tysiachi kilometrov', p. 17.
- 3 N. Osinskii, 'Amerikanskii avtomobil' ili rossiiskaia telega?' *Pravda*, 20 July 1927, p. 2; 21 July 1927, p. 3; 22 July 1927, p. 3. The title of the articles, 'The American automobile or the Russian cart?', served as the basis for discussions about the future of the Soviet automobile industry, as discussed below. For statistics on motor vehicles, their domestic production and imports see Tsudortrans, *Avtodorozhnoe khoziaistvo SSSR v tsifrah: statisticheskii sbornik* [Auto road management of the USSR in figures: statistical collection] (Moscow, 1935), pp. 154–5.
- 4 N. Osinskii, 'Pis'mo, napisannoe 6 noiabria 1937 goda' [Letter written on 6 November 1937], *Prozhektor* 45 (1928), 10–11. Reprinted in Osinskii, *Avtomobilizatsiia SSSR*, pp. 236–43.
- 5 O. V. Skvortsov (ed.), *Dorogi Rossii: stranitsy istorii dorozhnogo dela* [Roads of Russia: pages from a history of road affairs] (St Petersburg, 1996), p. 108; on Glavkomtrud see E. H. Carr, *The Bolshevik Revolution, 1917–1923* (3 vols, Harmondsworth, 1966) II, 211–12, and Thomas F. Remington, *Building Socialism in Bolshevik Russia: Ideology and Industrial Organization, 1917–1921* (Pittsburgh PA, 1984), pp. 82–92.
- 6 A. A. Nadezhko (ed.), *Dorogi Rossii, istoricheskii aspekt* [Roads of Russia: historical aspect] (Moscow, 1996), p. 73.
- 7 On road expenditures see *Trud*, 17 April 1930, p. 6, and Gosudarstvennyi Arkhiv Rossiiskoi Federatsii (GARF), f. 4226 (Society for Co-operation in the Development of Automobilism and Road Improvement), op. 1, d. 5, l. 55v. On railroads see E. A. Rees, *Stalinism and Soviet Rail Transport, 1928–1941* (London, 1995), pp. 12, 25.
- 8 On the TurkSib project see Matthew J. Payne, *TurkSib: Stalin's Railroad and the Building of Socialism* (Pittsburgh PA, 2000). For tractors and airplanes see respectively Dana G. Dalrymple, 'The American tractor comes to Soviet agriculture: the transfer of a technology', *Technology and Culture* 5, 2 (1964), 191–214, and Scott W. Palmer, *Dictatorship of the Air: Aviation Culture and the Fate of Modern Russia* (Cambridge, 2006).
- 9 GARF, f. 4426, op. 1, d. 59, ll. 1–94; d. 317, ll. 4–51. The two debates occurred in November 1927 and January 1928.
- 10 E. Chudakov, 'Budushchee avtomobil'noi promyshlennosti v SSSR' [The future of the automobile industry in the USSR], *Za rulem* 1 (1928), 3. At this point, ten years after the October revolution, the country had fewer passenger cars than in 1913, or one car for every 7,000 inhabitants, compared with 196 in Germany, forty-six in France, thirty-four in England, and five in the already car-crazy United States. Tsudortrans, *Avtodorozhnoe khoziaistvo*, p. 139.
- 11 For details on the agreement and the GAZ factory see Lewis H. Siegelbaum, *Cars for Comrades: the Life of the Soviet Automobile* (Ithaca NY, 2008), pp. 36–79.
- 12 Like many other such organisations, Avtodor was disbanded by the state in the mid-1930s. For more on Avtodor and its activities see Tracy Nichols Busch, "A class on wheels": Avtodor and the "automobilization" of the Soviet Union, 1927–1935', Ph.D. dissertation, Georgetown University (2003). For an exemplary history of another voluntary organisation see Daniel Peres, *Storming the Heavens: the Soviet League of the Militant Godless* (Ithaca NY, 1998).
- 13 See respectively Bruce E. Seely, *Building the American Highway System: Engineers as Policy Makers* (Philadelphia, 1987), pp. 42–54, 83–7; Stephen L. Harp, *Marketing Michelin: Advertising and Cultural Identity in Twentieth Century France* (Baltimore MD, 2001), pp. 2126; Rudy Koshar, 'Germans at the wheel: cars and leisure travel in interwar Germany', in Rudy Koshar (ed.), *Histories of Leisure* (Oxford, 2002), pp. 215–30.

- 14 Loren R. Graham, *The Ghost of the Executed Engineer: Technology and the Fall of the Soviet Union* (Cambridge MA: Harvard University Press, 1993), quotation on p. 34. For more on the fate of Soviet engineers in the Stalin era see Kendall E. Bailes, *Technology and Society under Lenin and Stalin: Origins of the Soviet Technical Intelligentsia, 1917–1941* (Princeton NJ, 1978).
- 15 Rossiiskii Gosudarstvennyi Arkhiv Ekonomiki (RGAE), *f.* 4372, *op.* 31, *d.* 998 (Five Year Plan of development of auto route transport, proposed by Tsudortrans), *ll.* 76–84.
- 16 George S. Counts, *A Ford crosses Soviet Russia* (Boston MA, 1930), pp. 34–5, 41. National Archives (College Park MD), Records of the Department of State relating to the Internal Affairs of the Soviet Union, 1930–1939, 861.5017, Living Conditions/567.
- 17 Allen C. Lynch, ‘Roots of Russia’s economic dilemmas: liberal economics and illiberal geography’, *Europe–Asia Studies* 54, 1 (2002), 34. For the argument that Russia is uniquely cursed by the combination of harsh climate and predominantly clay soils see Aleksandr Nikonov, ‘Ukhaby na dorogakh’ [Holes in the roads], *Novaya gazeta*, 21 August 2003, p. 16.
- 18 *Sotsialisticheskoe stroitel’stvo SSSR, Ezhegodnik* [Socialist construction of the USSR: annual] (Moscow, 1935), pp. 451–2. More than 90 per cent of the distance of local roads were classified as ‘unimproved’, and a mere 1.5 per cent were all-weather. By the mid-1940s a third category (republic, *krai*, and *oblast* roads) had been added at least for transport purposes. See A. S. Kudriavtsev, *Avtoguzhevye dorogi i tekhnika uskorennoho vosstanovleniia proezda na nihk* [Auto freight roads and the technique of their rapid restoration] (Moscow, 1944), p. 9.
- 19 For the 1928 decree see *Za rulēm*, 9 (1929), 32. This contains the RSFSR version. Analogous measures were passed by other union republics.
- 20 Nichols Busch, ‘“A class on wheels”’, pp. 25–6 (also p. 221). For a similar interpretation see Sheila Fitzpatrick, *Stalin’s Peasants: Resistance and Survival in the Russian Village after Collectivization* (Oxford, 1994), pp. 69, 99, 111, 128–9, 133–4, 179.
- 21 Dorothy Atkinson, ‘The Zemstvo and the peasantry’, in Terence Emmons and Wayne S. Vucinich (eds), *The Zemstvo in Russia: an Experiment in local Self-government* (Cambridge, 1982), p. 98.
- 22 Holland Hunter, *Soviet Transport Experience: its Lessons for other Countries* (Washington DC, 1968), p. 95.
- 23 Tat’iana Belova, ‘Dorogi tridtsatogo goda’ [Roads of the 1930s], *Vechernii Novosibirsk*, 22 March 2003, at www.vn.ru/22.3.2003/ (accessed 17 May 2005). This is the on-line version of western Siberia’s main newspaper. The article includes extensive material from regional archives.
- 24 *Komsomol’skaia pravda* [Komsomol Pravda], 27 August 1931, p. 3.
- 25 GARF, *f.* 4426, *op.* 1, *d.* 499, *ll.* 148, 197; *d.* 489, *ll.* 1, 8; quotation from Nichols Busch, ‘Avtodor and automobilization’, p. 231. Avtodor’s rural membership was not too plentiful. As late as June 1932, of a reported membership in the RSFSR of nearly 900,000, only some 124,000 (14 per cent) were rural-based. In terms of individual branches (‘collectives’), one in five was located in the countryside. *Izvestiia*, 23 June 1932, p. 2.
- 26 GARF, *f.* 4426, *op.* 1, *d.* 13, *l.* 10; *Za rulēm* 19 (1931), 1.
- 27 GARF, *f.* 4426, *op.* 1, *d.* 5, *ll.* 131, 206–14; *d.* 6, 49v–50. The Young Pioneers were a mass youth organisation founded in 1922 for those aged ten to fifteen.
- 28 Tsudortrans, *Avtodorozhnoe khoziaistvo*, pp. 44–5; *Sotsialisticheskoe stroitel’stvo*, p. 451.
- 29 GARF, *f.* 4426, *op.* 1, *d.* 488 (stenographic report of First All Union Conference on Road Construction, 15 May 1932), *ll.* 15, 23–8, 56, 72, 88–9.
- 30 Tsudortrans, *Avtodorozhnoe khoziaistvo*, pp. 44–5.
- 31 *Istoriia kolkhoznogo prava. Sbornik zakonodatel’nykh materialov SSSR i RSFSR 1917–1958 gg.* [The history of collective farm law: collection of legislative materials of the USSR and RSFSR, 1917–1958] (2 vols, Moscow: Gosizdiuridlit, 1959) I, pp. 329–30.
- 32 GARF, *f.* 4426, *op.* 1, *d.* 488, *l.* 24; *d.* 10, *ll.* 298–313; *Istoriia kolkhoznogo prava*, pp. 478–9.
- 33 GARF, *f.* 4426, *op.* 1, *d.* 43 (stenographic report of meeting of central council employees with Tsudortrans, 1935), *l.* 72.
- 34 Gushosdor, *Instruktsiia po zapolneniiu raiispolkomami otchetnoi kartochki (forma No. 100) o vypolnenii plana truduchastiia i dorozhnykh rabot po mestnym dorogam na 1937 god* [Instructions to district executive committees on filling in report cards (form No. 100)

- for fulfilment of the plan for labourers and road works on local roads for 1937] (Moscow, 1937).
- 35 *Doroga i avtomobil'* [Roads and the Automobile] 11 (1937), 44; Valery Lazerev and Paul R. Gregory, 'The wheels of a command economy: allocating Soviet vehicles', *Economic History Review* 55, 2 (2002), 343; Fitzpatrick, *Stalin's Peasants*, pp. 216–17; *Pravda*, 25 August 1937, p. 2. The number of trucks 'in agriculture' increased from 26,600 at the end of 1933 to 195,800 at the end of 1938, according to *Sotsialisticheskoe stroitel'stvo Soiuza SSR 1933–1938 gg.: Statisticheskii sbornik* (Moscow, 1939), p. 88.
 - 36 *Pravda*, 10 May 1933, p. 5.
 - 37 For more on the reasons for Avtodor's dissolution see Nichols Busch, 'Avtodor and automobilization', pp. 111–13, 185–7.
 - 38 *Pravda*, 29 October 1935, p. 1; 4 March 1936, p. 2; *Za rulëm* 7 (1936), 25.
 - 39 Gulag is an acronym for Main Administration of Corrective Labour Camps. It is the subject of a literature too vast to cite here. On the White Sea–Baltic (Belomor) Canal see M. Gor'kii, L. Averbakh, and S. Firin (eds), *Belomorsko–baltiiskii kanal imeni Stalina: istoriia stroitel'stva 1931–1934 gg.* [The White Sea–Baltic Canal named Stalin: history of its construction, 1931–1934] (Moscow, 1934); Cynthia A. Ruder, *Making History for Stalin: the Story of the Belomor Canal* (Gainsville FL, 1998); Graham, *Ghost of the Executed Engineer*, pp. 61–5.
 - 40 A. S. Kudriavtsev, 'K vysotam sovremennoi dorozhnoi tekhniki' [Toward the heights of contemporary road technology], *Doroga i avtomobil'* 7 (1937), 2–3. See also No. 4 (1937), 24–5. On the Industrial Party trial of 1930 (in which Pavel Palchinsky was cited as the main conspirator) see Bailes, *Technology and Society*, pp. 95–121. Serebriakov's past as an associate of Trotsky and other erstwhile foes of Stalin probably had more to do with his arrest and execution.
 - 41 For a brief biography of Perepëlkin, composed by some of his former friends after his posthumous rehabilitation in the 1950s, see 'Iz istorii avtomobilia v Rossii' [From the history of the automobile in Russia], at www.imwerden.de/autohistory.htm (accessed 4 April 2005).
 - 42 Paul Josephson, "Projects of the century" in Soviet History: Large-scale Technologies from Lenin to Gorbachev', *Technology and Culture* 36, 3 (1995), p. 520. James C. Scott, *Seeing like a State: how Certain Schemes to improve the Human Condition have Failed* (New Haven CT, 1998), pp. 193–222. Indeed, the project seems an even better example from Soviet history than the prime one that Scott deploys—collectivisation.
 - 43 The memorandum, dated 25 November 1935, is in O. V. Khlevniuk (ed.), *Ekonomika Gulaga*, vol. III in *Istoriia stalinskogo Gulaga: Konets 1920–kh—pervaia polovina 1950–kh godov* [The economics of the gulag, vol. III of The history of the Stalinist Gulag, end of the 1920s—first half of the 1950s], ed. V. Kozlov (Moscow, 2004), pp. 136–44.
 - 44 *Ibid.*, pp. 138–9. On Moscow-centeredness see James van Geldern, 'The centre and the periphery: cultural and social geography in the mass culture of the 1930s', in Stephen White (ed.), *New Directions in Soviet History* (Cambridge, 1992), pp. 62–80.
 - 45 N. V. Petrov, 'Istoriia imperii "Gulag"' at www.pseudology.org/GULAG?Glava06.htm 6:3 (accessed 5 April 2005). Petrov is one of the leading experts on the Gulag (see below, note 51). The directive he cites here has not otherwise been published.
 - 46 Dm. B., 'Germanskii avtostrady', *Za rulëm*, (1936), 13–14. For similar assumptions among contemporary commentators in France, Britain, and the United States see James D. Shand, 'The Reichsautobahn: symbol for the Third Reich', *Journal of Contemporary History*, 19, 1 (1984), 196–7. Shand argues that 'geographic, demographic, and economic factors, not military considerations, dictated the placement of the *Autobahnen*', and this seems to have become the scholarly consensus.
 - 47 O. Esterkin, 'Avtomobil'naia magistral' Moskva–Minsk', *Pravda*, 18 July 1936, p. 4. On the building of the autobahns and conflicts over their relation to the landscape see Thomas Zeller, "The landscape crown": landscape, perceptions, and modernizing effects of the German *Autobahn* system, 1934 to 1941', in David E. Nye (ed.), *Technologies of Landscape: from Reaping to Recycling* (Amherst MA, 1999), pp. 218–38. See also his *Driving Germany: the Landscape of the German Autobahn, 1930–1970* (Oxford, 2007).
 - 48 *Ibid.* See Josephson, 'Projects of the century', p. 536, for a similar statement by Maxim Gor'kii.
 - 49 O. Mikhailov, 'Na magistrali Mosvka–Kiev' [On the Moscow–Kiev highway], *Pravda*, 9 August 1936, p. 4.

- 50 For a brief history of the highway's construction see 'Avtomagistral' Moskva–Minsk' [The Moscow–Minsk highway], on the web site of Rosavtodor, the Russian Federation's Ministry of Transport, at www.rosavtodor.ru/doc/history/minsk.htm (accessed 9 January 2008).
- 51 N. V. Petrov and K. V. Skorkin, *Kto rukovodil NKVD, 1934–1941. Spravochnik* [Who ran the NKVD, 1934–1941? Reference book] (Moscow: Zven'ia, 1999), pp. 109–10, 133–34, 176, 283, 417. Petrovich-Shteinpres' execution came on 2 March 1939. All of these men were posthumously exonerated in 1956.
- 52 Quoted in S. A. Kornienko and V. A. Gaiduk, 'Avtomagistrali sovetskogo soiuz'a' [Highways of the Soviet Union], *Stroitel'stvo dorog* 2 (1938), 5–6.
- 53 Nadezhko, *Dorogi Rossii*, pp. 95, 98–9; *Pravda*, 24 August 1938, p. 6; A. I. Kokurin and N. V. Petrov, *GULAG (Glavnoe upravlenie lagerei) 1917–1960* [GULAG (Main Administration of Camps), 1917–1960] (Moscow, 2000), pp. 781–2.
- 54 Data cited in Hunter, *Soviet Transport Experience*, table C-12, p. 178.
- 55 I. I. Dumoulin, 'Ford 1934 g. v probege' [Road test of a 1934 Ford], *Za rulëm* 20 (1934), 6. Dumoulin's observation is reminiscent of yet another Russian aphorism about roads, 'In Russia there are no roads, only directions', cited in *Komsomol'skaia pravda*, 27 August 1931, p. 3. Dumoulin also accompanied Osinskii on the 1929 auto trip cited at the beginning of this article.
- 56 Hunter, *Soviet Transport Experience*, table C-6, p. 173. Other hard-surfaced roads increased from 80,700 km to 136,300 km.
- 57 Also arrested was his twenty-five-year-old son, Dima, a designer–engineer who worked for the Commissariat of Defence Industries. At the time Osinskii was serving as Director of the Academy of Science's Institute of the History of Science and Technology. He languished in prison until his execution on 1 September 1938, in his fifty-first year. See the extract of his daughter's memoirs published as 'Vospominaniia ob otse' [Memories of my father], *Za rulëm* 4 (2000), 225.
- 58 Hunter, *Soviet Transport Experience*, p. 96.
- 59 Josephson, 'Projects of the century', p. 522.

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