PHOTO HUNT

KRASNAYA PRESNYA AT NIGHT

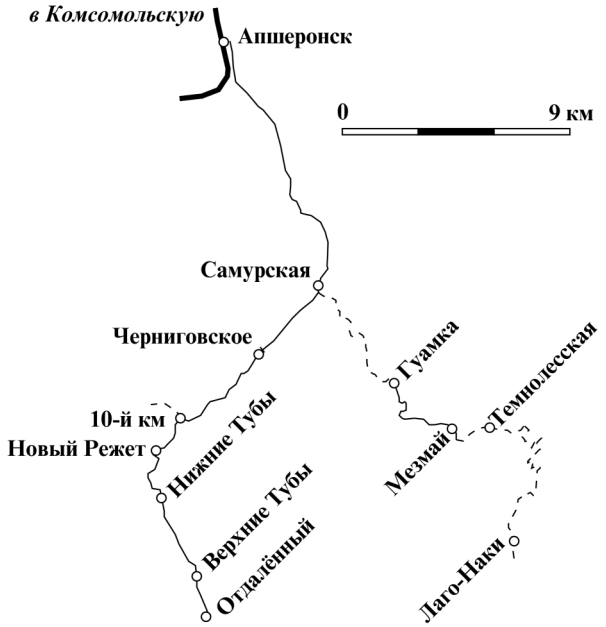
N. Kalashnikov (Moscow) tells a story of the night life of “Krasnopresnenskoe” subway shed. All pictures taken on May 7, 2004.

BACKROADS AND BACKCOUNTRIES

NARROW GAUGE SITES OF KRASNODAR TERRITORY APSHERONSK–GUAMKA–MEZMAY

I used my four vacation days at the beginning of May to finally carry out my old idea — to visit the narrow gauge railway in Apsheronsk and the unique natural monument of the Krasnodar territory — Guamka gorge. From the trip I brought back unforgettable recollections and a plenty of impressions, which I am going to describe to the reader of my story.

Apsheronsk forestry narrow gauge railway used to be a single system Apsheronsk–Samurskaya–Siding 10 km–Otdalennoe (Shpalorez) with two offshoots: a small branch from Siding 10 km to Kushinka and the eastern mountain section, which penetrated the Guam gorge (Samurskaya–Guamka–Mezmay–Temnolesskaya–tourist center "Lago-Naki").



Apsheronsk Railway © D. Zinóviev

So, what does the road look like today? The track from Temnolessky to the tourist center "Lago-Naki" was dismantled in the 1960–70s. The section from junction station Samurskaya to Guamka in the 1980s was badly destroyed by floods, its restoration was too expensive, and then it was finally dismantled, too. As a result, the Apsheronsk system was torn into two autonomous parts. And this is how it is now.

In 2002 the 8-kilometer mountain section Guamka–Mezmay was also badly damaged by a flood, and as a result Mezmay settlement was literally cut off from the "mainland." It is amazing, but in 2003 they undertook its restoration. "*Small company "Apsheronsk" is conducting reparative works on narrow gauge railway in Guamka gorge*" (03.12.2002), "*destroyed bridge restored in Mezmay*" (25.03.2003), "*construction of the new railway is coming to end in Guamka gorge*" (15.05.2003). At the end of 2003, judging by Kuban news, "the Road of Life" from Guamka to Mezmay was completely restored after the flood.

Narrow Gauge Railroad of Apsheronsk Lumbering Enterprise ("Apsheronsklesprom")

Away from the main roads, in the bottom of the Caucasian mountains, somewhere between Maykop and Tuapse, there is a small town of Apsheronsk. In the early Saturday morning on May 1, 2004, I get on a from Rostov-on-Don to Apsheronsk, and after an 8 hour journey I begin the study of the local narrow-gauge peculiarities.

My acquaintance with the narrow gauge railway in Apsheronsk began at its northern point, located in the territory of the log mill. The imposing dimensions of the now almost empty mill suggest, that earlier there were a plenty of tracks here. Now two narrow-gauge tracks go just a little into the territory of the mill. Half-rotten ties and fissures in the earth remind of the extension of the railway that used to be here long ago. Several rusty passenger coaches (PV) without bogies can be also seen here.

This is how the log mill looks from the station

I walk along the tracks southwards. Immediately after the log mill the the railway intersects street Kommunistichеskaya, and there begins the territory of station Apsheronsk-Narrow Gauge.

Station type old buildings are located on both sides of the northern neck: one (to the left) is re-equipped into a stomatological office, the another (to the right) is half-

wrecked and abandoned. There is also an original monument in the honor of the 50s anniversary of railway with numbers "1927–1977." The gray stone monument stands on two narrow-gauge bogies. It occurs that the railway was constructed in 1927 by the Gulag prisoners, and the corpses were buried directly in the mound. . .

The northern neck of Apsheronsk station

The territory of station impresses: considerable number of tracks, manual switches with striped plates, a wye; on the station track there stands a lumber consists that recently arrived from the mountains; near the shed there are a TU8P diesel locomotive with a luggage car, a fire train, a tank car, wooden freight cars. It is beautiful!

The main track of Apsheronsk station

Besides lumber transportation, there is also regular passenger traffic: on weekends a passenger train (a TU8P with a luggage car) departs from here to the southern endpoint of the main line — to the town of Otdalenny.

In the southern part of the station the transloading facility is located. Beyond the southern neck there is a grade crossing (Sport street) and an unusual tall entry traffic signal on a semaphore mast. Then the narrow track goes around the town along Partizanskaya street, near "Lesselmash" plant, and further to the south towards the mountains.

Guamka Gorge Narrow Gauge Railway

The main purpose of my trip was a visit to the unique narrow gauge railway in the Guamka gorge. So, early in a stimulating morning on May 2, I was met by the picturesque town of Guamka (50 km southern from Apsheronsk). Morning freshness, thin fog, and the light of the raising sun, gilding the peaks of the Caucasian mountains. . . It felt like gates into an unknown, wonderful world, which was thrown open before the eyes of a resident of a megapolis. Not a sound in nature, nor a breeze! The town captivated me with some special cosiness, calmness of narrow by-streets; even in spite of the abundance of tourists, it lived its quiet, unhurried life. A campground with accurate wooden cabins was adding to the picture. Practically everything here bore a clear imprint of remote Russian countryside.

One cannot fail to note the building of the former railway station: it is located in the town center. The station has three tracks and a wye. There are some remnants of rolling stock: a hand-made biaxial trolley for moving tourists through the gorge, and several rusty flatcars, forgotten in the cut-off section back in the logging times.

Guamka station: three tracks at the Caucasus

The rails are taken off before Guamka. Once the narrow gauge railway went from here westwards through the forest thicket and the file of creeks to Samurskaya main line station. Now one can hardly see only the remnants of the existed track: a narrow trampled path vanishing in the woods, with old ties grown into the dirt — that's all that is left of the railway. After the wash-out, section Samurskaya - Guamka has never been restored: it could not compete with cars and buses and was soon dismantled as totally useless.

Now I had to overcome the distance of 8 km eastwards along the narrow gauge railway: first get through the Guam-

ka gorge, and then climb to the town of Mezmay. This is the most exotic way for tourists — and standard for local residents of Mezmay.

Guamka: here began the track to Samurskaya

In front of me there is Guamka gorge — a unique creation of Nature, one of the most beautiful and majestic places of Krasnodar territory. It is a narrow canyon, pierced during millenia by the mountain river of Kurdzhips. The gorge is located between towns Mezmay and Guamka, its extent is 3 km, its depth — up to 400 m.

Guamka Gorge railway

I follow my way to where two high ridges tightly get together: to the left — the ridge of Guamka, to the right — the higher spurs of the Lago-Naki ridge, and between them there swiftly flows the Kurdzhips river. To enter the Guamka gorge, one has to pay 100 roubles per person. The gorge begins immediately and unnoticeably: just a moment ago all around there were wooded slopes and bright sun, and then, all of a sudden, perpendicular cliffs hang overhead, and the Kurdzhips goes far downward and makes noise somewhere below, squeezed in the narrow canyon several meters wide. The railway barely fits on a narrow shelf, cut in the left slope of the gorge by the prisoners of Gulag in the 1930s.

Water worked on the Guamka for thousands years. After the glacial period in the place of modern Mezmay town there was a mountain lake. The water from the lake escaped into the plain between the Lago-Naki and Guamka ridges, gradually washing out rocks and dirt. Later, in thousands years, people hollowed this long ledge in the cliff, on which they laid steel rails and ran trains. Other millenia will pass, the rails will vanish for good, but this artificial shelf will forever remain a mute monument to its creators.

I go along the track: somewhere straight on ties, somewhere next to the railbed. The state of the track is perfect: new flat rails, and the fresh ties still smell of creosote! Very unusual for a narrow gauge railway. Old dismantled rails and obsolete wooden ties lay piled along the line after the recent track repair.

Shining in rare solar rays, the steel track constantly winds, going around steep cliffs. The beauty of the vistas is truly astonishing. Not in vain the Guamka gorge is called an open-air museum. On the opposite slope of the gorge there are many-colored inclined layers of rocks (white, pink, brown, green, yellow, red; each color is explained by their geological structure), which were split by the rapid river in millenia. Deeply below seethes and laps the Kurdzhips. Above the almost perpendicular slopes, which hang overhead, and above the trees, one can see a narrow strip of clean dark-blue sky sandwiched between two gigantic rock walls. The springs break through at a high altitude, protrusions of the cliffs ooze with the flows of moisture and with brooks, and sometimes burst open with cascades of waterfalls. The trees, covered with shaggy overhanging strands of moss, are scattered across high cliffs. The flora is very diverse: oak, beech, yew-tree, fir tree, pine tree, and many other interesting and rare plants.

Old track in the gorge after the bridge across the Sukhaya Balka creek

Mountains, waterfalls, amazing nature, majestic natural decorations and the road itself, cut in a cliff, strike with the constantly changing views. The views are simply magical,

and the beauty can not be described in words! Unique microclimate, the noise of the mountain river, and the clean air strengthen the impression.

In the gorge there are many tourists and other pedestrians: some are going to Mezmay, like me, some — towards Guamka. Local residents can be clearly told from the others: indeed, this is almost the only easy path between the towns. In some places the road goes almost level with the river, but usually the river makes noise far below. And here in the waters of the seething flow there lies a sad monument — a diesel locomotive that fell down into the gorge several years ago. Impressive picture. . .

Approximately in the middle gorge there is located cafe "House for the visitors in the Guamka gorge," where it is possible have a snack and restore the energy spent while climbing the hill. By the way, those who want can hire the trolley to get into the gorge, gaily honking at the numerous turnings. However, the majority of people nevertheless prefer the pedestrian mode of transportation.

To my surprise, in spite of the media reports about the complete restoration of the railway to Mezmay, it turned out that railway was repaired only to the bridge across the Sukhaya Balka (less than half way between Guamka and Mezmay.) This is the place, where two gorges are get together: to the right, from a narrow and high gorge, there comes inflow Sukhaya Balka, that joins the Kurdzhips. From the narrow and high bridge it is interesting to observe the confluence of pure water of the Sukhaya Balka with brown clayish water of the Kurdzhips. After the bridge I see rails produced in 1937; the trolley does not go any further because of the poor track condition. The pedestrian path continues to go along the old boggy ties. The spikes in some places popped out, the ties fairly rotted and sagged. . .

Road to Mezmay

Wash-out near Mezmay

After the bridge across the Sukhaya Balka the gorge goes to the side, the mountains make room, the noise of the river calms down, and only reddish high cliffs raise to the left far on the other side of the Kurdzhips. Mud flows over the railway, and now and then the narrow track completely sinks in the dirt, so that the rails could not be seen. It's less then funny to walk along the mound on the boggy clay without special boots. After passing several hundred more meters, I discovered with horror that in several places the mound is strongly washed away, and the railway is completely unfit for rail traffic, although it is completely passable on foot. It is even possible to sit down to rest on ties.

Abandoned track near Mezmay

Soon the impenetrable section ends, and the dirt under the feet becomes harder. I brush off the heavy pieces of clay pulp against the rails and go further, towards the approaching forest. I find myself in private with the green surrounding world. Snags, sticks, twigs fill the forest and make it saturated and impassable. The only indicative of the human civilization is the old abandoned railway. But nevertheless it's cool to go along the ties! When I walk along an old railway, I get some special feeling, which gives hope; it seems that the road treats the wounds of soul. Nevertheless, this railway is a remarkable place, which harmoniously comes in touch with the miraculous nature; a journey through such places is an exceptional pleasure. It seems that any minute a whistle of a locomotive could be heard. . . And indeed once in these amazing places the whistles of locomotives were not rare, they were an ordinary phenomenon, and they were percepted as a part of the surrounding world.

Both the railway and the small towns served by it keep the half-forgotten spirit of the old times. After several more kilometers, right after the recently restored bridge across the Kurdzhips, there begins Mezmay town. In two places near the bridge the line is torn — the sections of track several meters long are either specially lifted off, or simply stolen by the locals for their needs.

Mezmay town was settled in the 1830s as a settlement of lumberjacks in a narrow valley in the confluence of the Kurdzhips and its inflow of Mezmay. The picturesquely located small houses populate both slopes of the valley, and around them are mountains and boundless forests. A working camp for prisoners was here before, and a narrow gauge railway was built timber removal. An almost universal "woodenness" strikes: there are virtually no brick structures

here. Wooden houses, triangular roofs, brick pipes, barking dogs, good-natured cows and dirty-faced pigs, which fell asleep in dirty puddles. . . I found myself in an entirely different world, which has nothing in common with our ordinary urban life. It seems that the time here flows slowly, or even does not flow at all, in spite of all the laws of nature. Indeed, it's worth getting here, glancing at the remote Russian countryside, and perceiving one's complete isolation from the customary civilization. In the past, this old abandoned narrow gauge railway was the only connection with that civilization; I can use these rails to go back. . . to return into the future: to "our" world, to "our" time. . .

Repaired bridge in Mezmay

Mezmay belongs to the geo-anomalous zone of Lago-Naki upland. They say that this amazing place possesses large attractive and energetic force. For a long time it was hidden from people by mountain slopes and three impenetrable gorges: Mezmay, Verkhny Kurdzhips, and Guamka.

The railway makes a right turn, and I can see the territory of Mezmay station. The picture is depressing: rusty rails and switches, old boxcars, the spirit of disintegration and abandonment. To the left the brick station building survived with the plate "Station Mezmay." On the tracks there stay retired remainders of the rolling stock: flatcars and a PV passenger coach. After the station there is a wye and a bridge across the creek of Mezmay. Among the tracks there walk cows and peacefully chew grass.

Mezmay station

A very special feeling appears, when one stays next to a neglected railway. One can imagine that it was once constructed in accelerated tempos, then worked, and there were people here who had their business. Now all it rusts, gets plundered and scrapped, needed by nobody, and forgotten. . . Far behind a fence, I see the remains of TU7 or TU8 diesel locomotive, and the dead, useless track runs away and vanishes behind a cliff. . .

A hope remains that perhaps the common sense will prevail, and the narrow gauge railway will be fully restored. And again, as in the old good times, a small diesel locomotive with green small coaches will whistle and leave Mezmay station along the gorge, along this amazing tracks, making it possible for its passengers to get impressed by the mountain views, creeks, and waterfalls. . . Possibly. . . Who knows. . .

A. Vershinin (Rostov-na-Donu). Text, photo

Life is good, for as long as the wheels knock!

The railway mailing list "1520mm" finally got its own logo, and not one, but several! In June 2003, the subsribers to the mailing list participated in a rating vote, and as a result, the first place was given to the design developed by V. Shulgin from Tula (to the left).

Mailing list "1520mm" — socializing with colleagues in trade and hobby; answers to any questions; news.

http://groups.yahoo.com/group/1520mm

NEWS FROM ABROAD

ØRESUND LINK

I confess to Their Majesties the Queen of Denmark Margrete II and the King of Sweden Karl XVI Gustav. I confess that I illegally crossed the border between Swedish and Danish kingdoms on the bridge across Øresund strait twice. And this crime was worth committing it — the complex is truth remarkable!

Øresund Link (photo by R. Plungė)
©"Kompiuterija–PC World" http://kompiuterija.lt

In reality it is not even a bridge, but the entire complex called "Øresund Fixed Link". The complex consists of coastal access automobile and railway lines (including highway interchanges and toll stations), a tunnel, a man-made island, two access gantry bridges, and a cable-stayed bridge. The bridge has two levels; the upper level is a four-lane highway (two lanes in each direction), the lower level — an electrified double-track railway.

The agreement about the construction of the Link was signed by the governments of the two countries in 1991, and the construction itself began in September 1993. Both monarchs participated in the solemn ceremony of the opening of "Øresund Link" on July 1, 2000. As a result, both countries obtained a new land neighbor — one another! Next day, at 6 A.M., the normal traffic of automobiles and trains from coast to coast became possible. Together with the "Stor Belt Link" across the strait of Store Baelt between the islands of Zealand (Sjælland, where Copenhagen is located) and Fyn (the island where Odense city is located), and with the bridge across the strait of Little Baelt (Lille Belt, between the island of Fyn and the Jutland — Jylland — peninsula), it was formed a continuous automobile-railway corridor from Central Europe to Scandinavia.

The first of the existed crossings was opened quite recently, in 1998. It is similar in layout to the Øresund Link (tunnel — island — bridge, if we go from Zealand to Fyn), but the autoroute and the railway coexist at the same level). Before the erection of this complex, Zealand and Fyn were connected only with ferry boats. The second crossing, across the Little Baelt, is much smaller and older.

The construction of the entire corridor was financed by the European Union and the bank of Europe. The Øresund Link was built by a consortium, headed by the Swedish concern SKANSKA, the one that constructed the Ice Palace in Saint Petersburg. The Danes did not really need this transit connection. Now they, as true Scandinavians, are worried about the air pollution in Denmark, and speak in favor of the limitation of trucking, and of the transfer of freight traffic to electrified railways.

Judging by everything, Denmark was nevertheless interested in the construction of the bridge precisely where it was built. Indeed, it would be more logical to construct the crossing further to the North — between Helsingor (Denmark, also known as Elsinore — the city of Hamlet, Prince of Denmark) and Helsingborg (Sweden). Here, the distance between the coasts is three times smaller. However, in that case, the route from Copenhagen (but not from the Continental Europe!) to Stockholm would not be a straight line, and the Copenhagen international airport of Kastrup would be irrelevant (now, it serves all the Southern Sweden).

The Complex

I will begin my description of the complex from the fact that a double-track railway line was laid from the center of Copenhagen into the airport. Now trains from the center section of Copenhagen, from the station of Østerport ("Eastern Gate") go through Nørreport ("Northern gate" — an underground station, future subway transfer), København H ("Central Station"), new bridge to island Amager (the airport) and two more intermediate stations (Tarnby and Ørestad) to station Københavns Lufthaven, Kastrup. The interval between trains is 10 minutes in the daytime and 30 minutes at night. It takes 14 minutes to go from København H to Kastrup. In use are series ER-IR4 three-coach EMU trains built by ABB. Furthermore, Regionaltog (local trains) from the airport to different ends of Zealand also use this line.

Trains from Copenhagen go thought the airport and the bridge to Malmö (Sweden) every 20 minutes in the daytime and every 60 minutes at night. It takes 35 minutes to go from København H to Malmö C, and 21 minutes from the airport to Malmö C. Danish series ER-IR4 and Swedish X2000 (also known as X2K) EMU trains are in use. In year 2004 it is planned to switch to new Øresundstog three-coach EMU trains, 27 of which have been built exclusively for the Link. Long distance trains (InterRail, EuroCity) from Central Europe to Scandinavia also go through the bridge and the airport.

The central station of Copenhagen — København Hovedbanegarden — has 13 passenger tracks and 7 platforms. Four of the platforms (8 tracks) are reserved for InterCity, X2K, InterCityLyn ("Lightning"), Regionaltog, and long distance trains; 2 platforms (4 ways) — for S-tog trains. There is a dedicated platform, Øresundsperron, for the Øresund trains, Øresundstog (they are designated with the hybrid of Danish "Ø" and Swedish "Ö": "Ö"). The station has the main waiting room above the tracks. A door leads

down to the escalators and the stairs to the platform. The station was built in 1911.

Station Københavns Lufthaven, Kastrup (literally "Copenhagen airport, Kastrup") is located underground, or rather in a groove with a glass roof. The center section of the station is exactly under the new international terminal N3 of the airport. The station is in a curve; before the arrival of a trains the lamps built into the edge of the platform smoothly turn on and off with the interval of three second. A bypass tunnel and a cargo terminal is built for freight trains. In several years one of the two new lines of the Copenhagen metro will come to the airport.

After the airport, the train travels in a groove, and then dives into the tunnel. The 430 m long part of the coast, where the tunnel portal is located, has been artificially built. The automobile tunnel is at the same level with the railway, side by side. The length of the tunnel is 3510 m.

From the tunnel, we emerge into a man-made island of Peberholm. The length of the railway across the island is 4055 m. At the eastern end of the island the highway climbs onto a mound.

The Western access bridge begins (3014 m), which gradually climbs upward. Approximately on 2/3 way along the bridge there is the state border between the two kingdoms passes; thus far, Denmark and Sweden had no land borders. We are entering the High bridge. This is a cable-stayed bridge, the navigation clearance is 57 m, and from the top a tug boat looks like a little yacht. The length of the bridge is 1092 m. Then we are passing the Eastern access bridge (3739 m). In principle a situation is possible, when th complex is completely closed for traffic. There were already cases in Denmark when automobiles were literally blown away by high crosswinds, therefore on the home page `www.oresundskonsortiet.com` they post a notice of whether the bridge is closed today, or not.

The overall length of the Link (without the access roads) is 15 840 m, including the tunnel (3510 m), the bridge (7845 m), and the washed sections (4485 m.)

Smoothly we descend down to the Swedish shore. The highway diverges to the right. Almost immediately the train stops at the new station Malmö Syd (Malmö-Southern), then goes around the city at the south goes, and then merges into the pre-existing railway. We go again around Malmö at the east, and finally arrive to station Malmö C.

The station building of Malmö Central was erected in 1858. The station has 12 stub tracks, 6 platforms. Track 5 is for the Øresundstog. This assignment is temporary, because the construction of the complex still continues.

In 2005 they plan to open the Malmö City Tunnel, which will considerably reduce the way from the Øresund Link (Malmö S) to Malmö C, and, moreover, convert Malmö C into a through station. Altogether, they plan to build 11 km of tracks, of them 6,2 km in the tunnel. The tunnel will pass directly under the city castle, which is surrounded by a preserved single-track museum streetcar line of (biaxial trolleys with two cabs, built in 1906). Three new stations will emerge: the underground Malmö C, the underground Triangeln, and above-ground Hyllie.

To conclude, let me say something about the economy of the Link. Before the construction of the Øresund Link, the connection between Sweden and Denmark was supported by ferry boats (auto and rail), and by high-speed Flygbatarna catamarans. I do not know, how much did the ferry cost, but here are the Flygbatarna fares (economy class): 35 DKK (about 110 RUR). A train ticket for Øresundstog from Norreport to Malmö C (2nd class) costs 60 DKK (190 RUR). The Øresund Link is the only toll highway in Denmark. The toll is 230 DKK (740 RUR) for a passenger car, 850 DKK (2720 RUR) for trailers longer than 16,5 m, and 1000 DKK (3200 RUR) for buses. Voilà!

Relevant Links

- http://www.broboken.com "The Book About The Bridge" (Book about Øresund Link)
- http://www.sundlink.se "The Bridge" (Sundlink Contractors — the consortium that built the Link)
- http://www.citytunnel.malmo.se "Citytunneln & Øresundsbroanslutningarna"
- http://www.oresundskonsortiet.se "Øresundsbron" (The company that exploits the Link.)
- http://www.malmo.se "Malmö stad" (Malmö city site)

I. Kopaysov (Saint Petersburg)

YOU WOULD NOT BELIEVE. . .

In 2001 at Lyublino station in Moscow an empty boxcar rolled away from the hump. It rolled straight towards a commuter train, but the turnout miraculously switched, and the boxcar was struck into a tank car. The tank fractured, and a liquid began to pour from the crack, and this liquid was none other but. . . alcohol. All station workers, armed with buckets and other vessels, came to "rescue" the contents of the tank, and the local residents also came to the smell. Despite the fact that some of the "resquers" were driven away in ambulances with severe alcoholic poisoning, some quantity of the Product nevertheless was spilled.

The owner of the alcohol sued the railway. The railway found the switchman (both literally and figuratively), who worked that day on that hump. And the switchman would pay for the alcohol and for the tank to the end of his days, if not for the clever attorney, who said that an **empty** boxcar could not ram a **full** tank car! And he dug up the norms and technical specifications, and he insisted on a detailed examination.

And it was discovered that the tank had been built in the Austro-Hungarian empire in 1907. This rarity, judging by the tracks from the splinters on the sides, went through the World War I, the Civil War, the World War II, and two Chechen wars (since it had been assigned to Daghestan). The boxcar just put the final period in its impressive biography. And the alcohol proved to be a contraband. As a result, the switchman was acquitted, and the alcohol case was transferred to Police of Economics Crimes. — *Ed.*

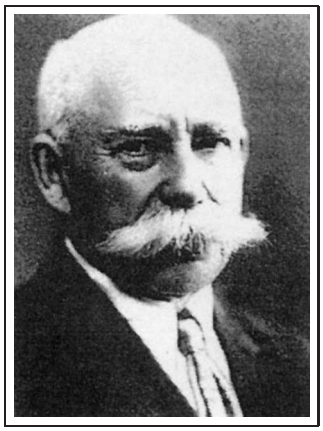
FROM THE ARCHIVES

CONSTRUCTION HISTORY OF THE AMUR RAILWAY

The Chinese-Eastern railway, built in the deviation from the original plan of the Transsib construction, instead of the line of Sretensk–Khabarovsk, did not protect the interests of Russia, which became especially obvious after the Russo-Japanese war.

In 1906 in Irkutsk there took place a special conference, at which the problems of communications in Siberia were examined. The participants supported the construction of the Amur railway as the matter of the ultimate priority. Local merchants, entrepreneurs, many interested persons supported this idea. The conclusion was: the road must be constructed in the Russian territory. Therefore, they reverted to the original plan, approved back in 1892. In 1908, the State Duma approved the construction of the Amur railway of the total length of 2041 versts (2178 km) from Sretensk to Khabarovsk with branches to Nerchinsk, Reynovo, and Blagoveshchenk.

The origin of the construction was at station Kuenga of the Transbaikal railway. From there to station Uryum there stretched the head section. The rest of the future railway was divided into three parts: western — from station Uryum to the Kerak river; middle — from the Kerak to the Diya river; eastern — from the Diya to Khabarovsk with the Amur bridge.



A. V. Liverovsky

In 1908 they started the works at the head section, in 1909 — on on the west, into 1911 — in the middle (with a 108 km branch to Blagoveshchenk). The construction of the last section from Malinovka at the Bureya river to Khabarovsk began in February 1912 and was headed by engineer M. S. Navrotsky, later — by D. P. Birsonov. But the most of the work was carried out by talented experienced engineer **A. V. Liverovsky**, the head of the eastern section of the Amur railway. It was he who began the construction of the Great Siberian Railway from Chelyabinsk in 1891, and it was he who completed the construction of the last section of the Transsib. He was greatly proud of his achievements. Considerably later, at the end of his life (Aleksandr Vasilyevich died in 1951, at the age of 85), he wrote: *"What can be gladder than to see that somewhere in the virgin taiga, in the desert, uninhabited, roadless place every day there grow the mounds, grooves get deepened, mountains step aside, giving place to the railway; turbulent flows are subdued, saddled by beautiful bridges, and water-abundant majestic rivers get subordinated to the human mind... And all around the empty places there appear mines, new plants, factories, towns, settlements, the new life."*

During the construction of the Amur railway the workers faced exceptional technical difficulties, which had not been encountered even in the heaviest sections of the Siberian railway: permafrost, covered with humus and sand, that allows thawing only at negligible depths. Hence, with the unfavorable drainage conditions, there appeared continuous swampiness, almost at the entire depth of thawing. It was very difficult to arrange water supply. Despite the fact that the head section was mostly following river valleys, those rivers could not be used as water supply in winter time because of their deep freezing. Digging artesian wells did not solve the problem, either, since in certain cases the quantity of water proved to be insufficient.

If the geologists happened to reveal nonfreezing springs during the analysis of the freezing conditions in the water-bearing layers under the bottoms of the rivers, adjacent to the railway, then these springs, of course, were used. As a rule, during the entire winter, water for the needs of work trains was taken from bore pits, reaching the underground horizons of river beds. The railway was laid on the extremely swampy terrain, intersected with mountain flows, among rocky ridges.

At the beginning of the construction along the line, for entire its length, there were neither settlements nor roads; mountain gorges, hillocky swamps, and stony hills made communications all but impossible. Substantial portion of the right-of-way was accessible only to pedestrians and equestrians. During snow melting, and also in the period of rains, some localities became completely inaccessible.

The eastern section, from the Bidzhan river to Khabarovsk, consisted of primordial taiga, gradually turning into the swampy hillocky valley of the Tunguska river and its tributaries, with no traces of human dwelling.

When the construction work began in 1912, there were only three settlements on the entire space from the Bureya river to Khabarovsk: In, Vira, and Pashkovo. It is understandable that in such difficult conditions,one of the first concerns was the building of access tracks, both for the movement of construction materials, workers and food, and for maintaining the communication between the line and the Cossack settlements on the Shilka and the Amur. Besides traditional temporary tracks, several branch lines were also built: Chasovinskaya from station Taptugary to the Shilka, Reynovskaya from station Rukhlovo (Skovorodino) to the Amur, as well as some dirt roads.

In spite of all the improbable obstacles to the construction of the Amur railway, the Russian engineering thought demonstrated its superiority in the railway building to the entire world and gained the priority in the solution of complex technical problems of surveying the route and building the railway on the permafrost and swamps.

The exceptional role in the organization of the building of the Amur railway and in the solution of those appearing numerous and most complex technical problems belongs

to Aleksandr Vasilyevich Liverovsky, under whose management the eastern section of the railway was shaped and built.

From Arkhara to Khabarovsk the route passed across the wooded Maly Khingan mountains (station Uril–station Kundur), gradually climbing them, and crossing the ridge in Lagar-Aul (at 378 m above the sea level). Between Lagar-Aul and Birobidzhan the railway went along the Bira river, getting down from the mountainous area, while in between Birobidzhan and Khabarovsk it crossed strongly swampy flat terrain. The construction line was broken into six sections. The administrations of five of them were located in Arkhara (chief engineer A. A. Bagdasaryants), Kundur (I. N. Sungarev), Obluchye (V. G. Kossakovsky), Bira (A. M. Esaulov), and In (N. V. Denisov). The sixth section, headed by engineer Kozhevnikov, was responsible for building the Amur bridge and the line from the bridge to Khabarovsk.

In the territory of the first section there lived cossacks and old believers, who did not justify the hope of A. V. Liverovsky to involve local residents into the construction. The railway required many thousands working hands. For example, in 1913 it employed 54,000 men. The use of "cheap" Chinese workers was stopped as soon as June 1910 a law was passed curtailing hiring the Chinese to execute "government-funded projects at the Far-Eastern outskirts."

Since that time only Russian workers, brought from European Russia and West Siberia, were occupied at the building of the railway. The contract workers were carried by the Transsib and Chinese Eastern railway to Vladivostok, then to Khabarovsk. Here after the inspection of the arrived (recruiters hired everyone without any selection!), the weak and the unhealthy were rejected as unfit to hard physical labor, leaving just some of them for light labor: as grooms, watchmen, etc. The rest of the unfit were sent back to their native lands at the government's expense. From Khabarovsk, it took another one-and-a-half month to get to the place of works (160 versts) because of the impassable roads.

Simultaneously with the construction of the railways there rapidly grew the roadside town of Sololi. The town soon became large station Obluchye. As builder I. Mulin, who worked first as a senior worker, then as a foreman, and finally as a draftsman, recollected, "*At that time everything astonished us: the silence, the untrodden taiga, the large wind-fallen woods, and the permafrost. Sometimes you would slip in a steep slope, tear away the moss by the boot, and see clean ice under it. . . Timber buildings did not appear soon. We lived in tents to the end of Winter 1911. The Nature rendered us furious resistance. In summer time, we suffered from gadflies and tongs. Mosquitoes and other gnats caused big troubles. Neither gloves nor mosquito masks saved our hands and faces. At the tasty place there emerged another kind of blood suckers: spirit traders. They were dubbed "hunchbacks", because these people appeared in the taiga with bags, complete of tin cans with alcohol. In the working teams, alcoholism began. But we did not drink because the life was too sweet. . .*"

Following O. P. Vyazemsky, A. V. Liverovsky gave preference to organize the works in an economic manner, without contractors, who often robbed workers and impeded building by the delivery of poor quality materials. In the eastern section of the Amur railway, 90% of all works were carried out in the economic manner. Being a booster of mechanization, A. V. Liverovsky ordered excavators from the Putilov Works in Saint Petersburg, and ten such machines, including seven multi-scoop tracks track-mounted ones, operated in the eastern section. For the first time in the practice of railway construction they widely adapted concrete and solution mixers and stone breakers. There appeared mechanical repair shops; saw-mill plants provided the construction with ties, beams, boards, and other materials. This all was directed toward lightening the labor and accelerating the progress of the project.

In the section from Arkhara to Bira in 1912–15 there were built bridges across the Arkhara, Mutnaya, Kuldur, Kamenushka, and Kimkan rivers, and **seven tunnels: Rachinskiy, Tarmanchukanskiy, Bolshoy and Maly Kazachinsky, Kasatkinsky, Obluchensky, and Lagar-Aulsky**. All the tunnels were constructed double-tracked, but it was not before the 1930s that the second track was used for regular trains, only for repair work.

The building of tunnels was conducted under the management of engineers V. G. Kossakovsky, I. N. Skugarevsky, E. G. Rozenberg, A. N. Passek, I. I. Borkovsky, S. V. Khlebnikov, A. S. Speransky, and master N. A. Vakulin.

The Lagar-Aulsky tunnel was the most unsuccessful one. Its building began in 1912, and finished in 1914; it became fully operational in 1915. Because of the incorrect conclusion of geologists about the soil composition, the tunnel was built using light type of finishing. Because of that, the tunnel soon began to fall apart. The main defect was in its irrigation. Later, in the 1920s, wooden gates were installed at the tunnel portals to keep it warm. In strong frost the tunnel was heated by bonfires and furnaces. However, in 1926 winch the gates had to be removed because of the inconvenience of works, frequent train delays, and repeated collisions and derailments, and because of the need to hire threes shifts of watchmen, which caused additional expenditures.

On February 12, 1914, the railway was completed: at milepost 180 versts from Khabarovsk, in 8 versts from station Kimkan, the rails were joint. The honor of laying the last meters of the Amur railway was given to the subdivisions led by engineer A. N. Passek and technician Radkevich. On February 17, 1914, the solemn jointing ceremony occurred at station Obluchye. The train, carrying the chief stahlmeister N. L. Gondatti and the chief of the construction engineer A. V. Liverovskiy, for the first time passed the junction. In March 1914 the commission of the State Duma proposed a bill reclassifying the working branches of the Amur railway as operational branches, and authorizing the construction of the road Administration in Alekseyevsk (Svobodny).

On March 10, 1915, the transportation of paid private freight, passengers, and luggage began between stations Vladimirovka and Domikan, and Arkhara and Innokentyevskaya. On April 15, the eastern section construction Administration started reviewing bids for the building of locomotive sheds and workshops at the 3rd class stations: at Arkhara — one shed with nine stalls, at Obluchye — one shed with six stalls and workshops, at Bira — one shed with six stalls, at In — one shed with six stalls and workshops.