

# Projects of 18<sup>th</sup> Century Transbaikalian Fortresses: Siberian Interpretations of the European Fortification Theory

*Progetti sulle fortezze transbaikaliane del XVIII secolo: interpretazioni siberiane della teoria europea delle fortificazioni*

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The history of the Russian development of Siberia, which began in 1581 with the campaign of the Cossack detachment under the leadership of ataman Yermak, is inextricably linked with the construction of fortifications. It was these strongholds which gave rise to many Siberian settlements, defining the modern settlement system of Russia to the east of the Ural Mountains. For several centuries, dozens of strongholds were created in this harsh region, which turned Siberia into a real land of fortresses<sup>(1)</sup>.

In the evolutionary chain of this rich and original fortification heritage, as well as in the history of military urbanism in Siberia, two major periods can be distinguished, fundamentally different both in engineering and in artistic terms.

The first of them (the late 16<sup>th</sup>-early 18<sup>th</sup> centuries) is associated with the construction of wooden towers designed to be defended with the help of hand firearms. These structures were represented in the two main types of fortifications of this period – wooden forts (*ostrogs*) and log house towns<sup>(2)</sup>. They were intended to control the Russian possessions in Siberia, which at that time consisted of dozens of small foci. Concentrating a small Russian population around and representing a symbol of statehood in the vast Siberian expanses, these strongholds were characterized by the peculiar aesthetics based on the laconicism and expressiveness of the forms of wooden log structures and picturesque layouts<sup>(3)</sup>.

The use of such tower fortifications continued in Siberia until the first decades of the 18<sup>th</sup> century. However, during the reign of emperor Peter the Great (1682-1725) it became clear that these traditional defensive structures could no longer meet the military engineering requirements of the time. The small foci of the Russian possessions in Siberia controlled by them gradually merged into a single territory that extended significantly to the south<sup>(4)</sup>, causing the political and economic need to establish its clear borders with neighboring nomadic and semi-nomadic states. These states, well-organized, armed with artillery

<sup>(1)</sup> Vladimir Tsaryov, Valentin Gorbachyov, Nikolay Kradin et. al. "Formirovaniye struktury rasseleniya v protsesse russkogo osvoyeniya Sibiri v 16-18 vv." ["Formation of Settlement Structure in Process of Russian Development of Siberia in the 16th-18th cent.], in *Gradostroitel'stvo Sibiri [Urban Planning of Siberia]*, Vladimir Tsaryov, Valentin Gorbachyov, Nikolay Kradin et. al. (eds.) (St.Petersburg, Kolo, 2011).

<sup>(2)</sup> Nikolay Kradin, *Russkoe derevyannoe oboronnoe zodchestvo [Russian Wooden Defense Architecture]* (Moscow, Iskusstvo, 1988).

<sup>(3)</sup> Dmitriy Rezun, Ruslan Vasilyevskiy, *Letopis' sibirskih gorodov [Chronicle of Siberian Cities]* (Novosibirsk, Novosibirskoe knizhnoe izdatel'stvo, 1989).

<sup>(4)</sup> Aleksey Okladnikov, Viktor Shunkov, Vadim Aleksandrov et. al. (eds.), *Istoriya Sibiri v 5 tomah, vol. 2: Sibir' v sostave fyeodal'noy Rossii [History of Siberia in 5 vol., vol. 2: Siberia within Feudal Russia]* (Leningrad, Nauka, 1968).

**Abstract:** At the beginning of the 18<sup>th</sup> century the Russian Empire launched a grandiose building project: a creation of the Siberian boundary defensive lines. Being an integral part of the all-Russian border defensive system, they extended for hundreds of kilometers from the Ural Mountains to the East and consisted of dozens of linear forts. They represented unique objects of military urbanism, which were created by combining the Russian traditions of border protection and the ideas of the European fortification theory. The article deals with designing fortresses for Transbaikalia (Eastern Siberia), a phenomenon of the 18<sup>th</sup> century military urbanism which is extremely poorly understood. The article presents the research results of graphic and written historical documents (date to 1760-70s) proving that in Transbaikalia as in Western Siberia the defensive lines really existed (Nerchinskaya and Selenginskaya lines) and that its linear fortresses were designed based on the ideas of the European theory of fortification and the principles of rational urban planning thinking.

**Keywords:** Fortress projects, 18<sup>th</sup> century, Fortification theory, Transbaikalia, Siberia

and having their own foundry and cannon manufacturing, represented a dangerous threat for the Russian mines, towns and settlements in Siberia<sup>(5)</sup>. This required a revision of approaches to the construction of fortifications and an application of fundamentally new solutions in the organization of the very system of protection of the emerging borders of Russia in Siberia. The result of the implementation of the overdue changes was the creation of the system of the *Siberian defensive lines*. Being an integral part of the all-Russian border defensive system, they extended for hundreds of kilometers from the Urals to the east and included dozens of *linear forts*<sup>(6)</sup> of various capacities, ranging from large permanent fortresses to small redoubts<sup>(7)</sup>.

The Siberian linear forts represented unique objects of military urbanism, which were created by combining the Russian traditions of border protection (*storozhevye lines*, 15<sup>th</sup>-17<sup>th</sup> centuries<sup>(8)</sup>) with the ideas of the European fortification theory. We believe that the treatises played a key role in transferring these ideas to the Russian military architecture. In the first quarter of the 18<sup>th</sup> century at the initiative of tsar Peter I, the works of famous European theorists were translated into Russian<sup>(9)</sup>: the treatise about Georg Rimpler's military architecture, the writings by Leonhard Christoph Sturm, Menno van Coehoorn, François Blondel and de Cambray's book about "Vauban's fortification"<sup>(10)</sup> were published at the time. The treatise by the Austrian military engineer Ernst Friedrich von Borgsdorf written in Russian and German was also issued. In addition, the writings of Georg Andreas Böckler and Johann Jacob Werdmüller were translated but were never printed and they have survived only in a manuscript form in the private library of Peter I<sup>(11)</sup>. Our research results, some of which will be presented in this paper, prove that the ideas from the treatises of European military engineers were put into practice when the forts of the Siberian defensive lines were constructed. Conventionally, these forts could be designated as "European-type" fortifications. We define the time of their creation as the second major period in the evolution of Siberian military architecture

<sup>(5)</sup> Leonid Bobrov, "Dzhungarskoye khanstvo – poslednyaya kochevaya imperiya" ["Dzungar Khanate – Last Nomadic Empire"], *Nauka iz pervykh ruk* 13, 1 (2007), 67-69.

<sup>(6)</sup> The term *linear (lineynye)* forts is traditionally used in Russian 18<sup>th</sup> century documents and in Siberian Cossack Army historical studies to designate the forts on the Siberian defensive lines. See e.g: Historical Archive of the Omsk Region, *coll.* 366, series 1, file 91; Petr Slotvov, *Istoricheskoye obozreniye Sibiri. Kniga 2: S 1742 po 1823 g.* [Historical Review of Siberia. Book 2: From 1742 to 1823] (St.Petersburg: I. Ckorohodov, 1886), 170.

<sup>(7)</sup> Daria Shemelina, *Formirovaniye planirovochnoy struktury ukreplenykh sibirskikh oboronitel'nykh liniy 18 v.* [Planning Structure Formation of Forts of Siberian Defensive Lines in the 18<sup>th</sup> cent.] (Candidate of Architecture diss. [PhD diss. equivalent], Scientific Research Institute of Theory and History of Architecture and Urban Planning, Moscow, 2010).

<sup>(8)</sup> Viktor Yakovlev, *Evolutsiya dolgovremennoy fortifikatsii [Evolution of Permanent Fortification]* (Moscow, Gosudarstvennoe voennoe izdatel'stvo narkomata obrony SSSR, 1931); Irina Buseva-Davydova, Nikolay Godlevskiy, "Goroda-kreposti po zasechnym chertam yuga Moskovskogo gosudarstva" ["Fortress-Cities Along Border Lines of South of Moscow State"], in *Gradostroitel'stvo Moskovskogo gosudarstva 16–17 vv.* (The Russian Urban Planning Art Library), Nikolay Gulyanitskiy, Yefim Basin, Irina Buseva-Davydova et. al. (eds.) (Moscow, Stroyizdat, 1994), 59-86.

<sup>(9)</sup> Tatiana Bykova, Myron Gurevich (eds.), *Opisanie izdaniy grazhdanskoy pechati. 1708 – yanvar' 1725 g.* [Description of Civil Type Editions. 1708 – Jan. 1725] (Moscow - Leningrad, AN SSSR, 1955), 78-80, 86-88, 93-94, 118-119, 436-437.

<sup>(10)</sup> Daria Shemelina, "Sebast'yan de Voban i "Istinnyy sposob ukrepleniya gorodov": k voprosu ob atributsii traktata" ["Sébastien de Vauban and the "Veritable Method of Fortification": Regarding the Attribution of the Treatise"], *Arkhitekturnoye nasledstvo* 65 (2016), 113-127.

<sup>(11)</sup> Irina Lebedeva, *Biblioteka Petra I. Opisanie rukopisnykh knig [Library of Peter I. Description of Manuscript Books]* (St.Petersburg, BAN, 2003), 142-145, 134-135.

and the history of military urbanism. This period was characterized by a radical turn from traditional national fortification and planning decisions towards European military engineering ideas, which were new to Siberia, and rational urban planning thinking laid down in Russia in the era of Peter the Great<sup>(12)</sup>.

It should be stressed that the forts of the second period of the Siberian military urbanism built on the defensive lines in the 18<sup>th</sup> century are relatively close to us in time, but paradoxically they remain much less studied than the older wooden tower strongholds built in the late 16<sup>th</sup>-early 18<sup>th</sup> centuries. Until now the subject of the defensive lines of the 18<sup>th</sup> century is only studied by a narrow group of specialists and their works are few and far between. In this regard, it can be stated, that the phenomenon of the Siberian defensive lines still remains surrounded by many unresolved research questions. For example, the features of adaptation of the European fortification theory when creating fortifications along the Siberian lines are almost unexplored. The specifics of the fortification design process are not defined. Even the exact location of some forts and the total number of fortifications along the Siberian lines remain in question.

But the most controversial and unexamined of all these research questions, in our opinion, is the problem of linear forts created in the 18<sup>th</sup> century on the borders of Russia with China, namely in Transbaikalia, a region located in Eastern Siberia. One of the aspects of this problem is the near absence of these objects in the research field of both the history of architecture and the history of Siberia as a whole. We assume that this is due to the formation of the historical concept of the "Siberian Line", which appeared in the 1760s during the reign of Catherine II. As it is known, Siberia is geographically divided into Western and Eastern Siberia. But historically, only the lines of Western Siberia were included in the concept of "Siberian Line" – Irtyshskaya, Gorkaya and Kolyvano-Kuznetskaya, which stretched from the Urals to the Mountains of Altai through the areas of the modern southern borders of Russia with Kazakhstan<sup>(13)</sup>. The defensive lines of Eastern Siberia developed a little later (by the 1770s) on the frontiers with China were not included in this concept and were treated as a separate border protection system<sup>(14)</sup>.

However, since the beginning of the 20<sup>th</sup> century, the situation with the view of historians on the defensive lines of Siberia has begun to change. Being left aside and being excluded from the concept of the "Siberian Line", although geographically located in the Siberian region, the defensive lines of Eastern Siberia gradually began to disappear from the research field of historians. In several studies of the second half of the 20<sup>th</sup> century - the early 21<sup>st</sup> century, the East Siberian linear fortifications were unfairly excluded from the overall historical picture.

<sup>(12)</sup> Nikolay Gulyanitskiy, "Introduction", in *Peterburg i drugie novye rossiyskie goroda* [Petersburg and Other New Russian Cities] (The Russian Urban Planning Art Library), Nikolay Gulyanitskiy, Yefim Basin, Irina Buseva-Davydova et. al. (eds.) (Moscow, Stroyizdat, 1995), 7-32.

<sup>(13)</sup> This is reflected in the documents of the reign of Catherine II. See e.g.: Instruction to lieutenant-general Springer, sent to Siberia to take over command over the lines there (11.931), in *Complete collection of laws of the Russian Empire. Collection (1649 - 1825) in 45 volumes. Volume 16 (June 28, 1762 - 1764)* (Tipografiya vtorogo otdeleniya sobstvennoy E.I.V. kantselyarii, 1830), 379.

<sup>(14)</sup> See, e.g.: "Stoletiye Voyennogo ministerstva. 1802-1902. *Konspekty istoricheskikh ocherkov*" ["Centenary of the War Ministry. 1802-1902. Synopsis of Historical Essays"], edited by Dmitry Skalon (St.Petersburg, M. Volf, 1906), 887, 435, 800; Slovtsov, *Istoricheskoye obozreniye*, 270-271; Afinogen Vasilyev, *Zabaykal'skiye kazaki: istoricheskiy ocherk* [Transbaikal Cossacks: Historical Sketch], vol. II (Chita, Tipografiya Voyskovogo khozyaystvennogo upravleniya Zabaykal'skogo kazach'yego voyska, 1916).

For example, they are not even mentioned in the fundamental generalizing historical works. In particular, the five-volume edition “History of Siberia” does not say a word about them<sup>(15)</sup>. The multi-volume edition “Russian Urban Planning Art”, where one of the chapters of one of the volumes is specifically devoted to the history of the development of the layout of Russian fortress cities, also does not mention the defensive lines of Eastern Siberia<sup>(16)</sup>.

Nothing is said about the linear fortifications of Eastern Siberia in many other works – both in those that deal with various aspects of the creation of the Russian defensive lines<sup>(17)</sup> and in those that relate to the history of their construction in the context of urban development of Siberia<sup>(18)</sup>. In this regard, it is not surprising that in discussions on the sidelines of conferences, some architectural historians speak about the construction of defensive lines as a phenomenon characteristic exclusively of Western Siberia, questioning the very fact of the existence of defensive lines in Eastern Siberia. Thus, they claim that only the Irtyshskaya, Gorkaya and Kolyvano-Kuznetskaya defensive lines were created in Siberia.

Against this background, the works that present a different and a broader view of the composition of the Siberian defensive lines system stand out. From these writings, it is clear that this system was not limited to the South of Western Siberia alone but extended further over the territory of Eastern Siberia running in the Transbaikal region – along the borders with China. The data of these works indicate, without any doubt, that defensive lines existed in Eastern Siberia<sup>(19)</sup> and were called the Nerchinskaya and the Selenginskaya lines<sup>(20)</sup>. At the same time, it should be noted that the authors of these works confined themselves mainly to stating the very fact of the existence of these lines, but without presenting any results of the research on the layouts of fortresses which they consisted of. The only exception is the work of Nikolay Kradin<sup>(21)</sup>, where the author analyzes the features of the Akshinskaya fortress of the Nerchinskaya line and provides data on its measurements.

As can be seen, one of the basic aims of our study was to find confirmation of the very fact of the creation of defensive lines in Eastern Siberia in the 18<sup>th</sup> century. Without achieving it, it would have been impossible to attain another aim, which we consider the main one for our study, that is, namely, to identify the planning and fortification features of the linear fortresses of Eastern Siberia based on archival materials that accompanied the process of their design and construction. It should be noted that the plans of the East Siberian linear fortifications have never been published in the scientific literature. The only exceptions are the above-mentioned work of Nikolay Kradin, dedicated to the

<sup>(15)</sup> *Istoriya Sibiri v 5 tomah [History of Siberia in 5 vol.]*, Aleksey Okladnikov, Viktor Shunkov, Zakhar Gogolev et. al. (eds.) (Leningrad, Nauka, 1968).

<sup>(16)</sup> Irina Buseva-Davydova, Nadezhda Krashenninnikova, “Goroda-kreposti” [“Fortress-cities”], in *Peterburg i drugie novye rossiyskie goroda* (The Russian Urban Planning Art Library), 275-301.

<sup>(17)</sup> Petr Vibe, Alexander Mikheev, Nadezhda Pugacheva, “Sibirskiy linii” [“Siberian Lines”], in *Omskiy istoriko-krayevedcheskiy slovar'* (Moscow, Otechestvo, 1994), 239-242; Nadezhda Krashenninnikova, “Stroitel'stvo russkikh krepostey 18 v. po 'obraztsovmym' proektam” [“Construction of Russian Fortresses in the 18th cent. on 'Exemplary Projects' ”], *Arkhitekturnoe nasledstvo* 25 (1976), 72-78; Tatiana Noven'kova, *Arkhitekturno-planirovchnaya organizatsiya pogranichnykh territoriy Rossii v 18 v. [Architectural and Planning Organization of Border Territories of Russia in the 18th cent.]* (Candidate of Architecture diss., Ural State Academy of Architecture and Fine Arts, Yekaterinburg, 2007); Dmitry Rezun, Mikhail Shilovsky, *Sibir', kon. 16 – nach. 20 v.: frontir v kontekste etnosotsial'nykh i etnokul'turnykh protsessov [Siberia, late 16th-early 20th cent.: Frontier in the Context of Ethnosocial and Ethnocultural Processes]* (Novosibirsk, Institute of History SB RAS, 2005).

<sup>(18)</sup> Nina Minenko, Valentina Ryzhenko, *Iz 18 veka - v vek 21: istoriya Omska [From the 18th to the 21st cent.: History of Omsk]* (St.Petersburg, Rus', 2008), 53-54; Alexey Gudkov, *Regulyarnoye gradostroitel'stvo v Sibiri v kon. 18 – perv. pol. 19 vv. [Regular urban planning in Siberia at the end of the 18th - first half of the 19th cent.]* (Candidate of Architecture diss., Moscow Architectural Institute, 1989); Larisa Vol'skaya, *Arkhitekturno-gradostroitel'noye naslediyе Sibiri [Architectural and Urban Planning Heritage of Siberia]* (Novosibirsk, NGA-HA, 2008); Viktor Kochedamov, *Pervyye russkiye goroda Sibiri [First Russian Cities in Siberia]* (Moscow, Stroyizdat, 1978).

<sup>(19)</sup> Andrey Plekhanov, “Pogranichnyye ukreplennyye linii” [“Border Fortified Lines”], in *Bol'shaya rossiyskaya entsiklopediya*, vol. 26 (Moscow, 2014), 516; Nikolay Kradin, “Zabaykal'skiye fortetsii” [“Transbaikalian Forts”], in *Gradostroitel'stvo Sibiri*, 200-210; Tatiana Proskuryakova, “Planirovchnyye kompozitsii gorodov-krepostey Sibiri (vtoroy poloviny 17-60-ye gody 18 v.)” [“Planning Compositions of Fortress-Cities of Siberia (the second half of the 17th–60s of the 18th cent.)”], *Arkhitekturnoe nasledstvo* 25 (1979), 57-71.

<sup>(20)</sup> The names of these lines come from the names of Siberian rivers – Nercha and Selenga.

<sup>(21)</sup> Kradin, “Zabaykal'skiye fortetsii”.

Akshinskaya fortress as well as the article by Tatiana Proskuryakova<sup>(22)</sup>, where the author without any analysis gives a plan of the Prinerchinskaya fortress, referring it, as follows from the context of this study to the Nerchinskaya line. This, in our opinion, is questionable, since, as it will be shown below, the Prinerchinskaya fortress never was part of this line. In the light of the above, it seems that it is this near absence of published graphic materials on the fortifications of the defensive lines of Eastern Siberia that caused the denial by some architectural historians of the fact of the existence of these forts.

To attain the aim of identifying the planning and fortification features of the linear fortresses of Eastern Siberia, we suggested that these forts were designed based on the ideas of the European theory of fortification and the principles of rationalism inherent in the Russian urban planning of the 18<sup>th</sup> century. In other words, we assumed that the experience of building fortifications along defensive lines in Western Siberia, studied in our previous research<sup>(23)</sup>, was transferred to Eastern Siberia. While verifying this hypothesis, in the archives of the Russian Federation, we succeeded in detecting several written and graphic documents of the 18<sup>th</sup> century, the analysis of which allows us to confirm our hypothesis. Below we present some of the results of this analysis.

#### **From the 1760 count Shuvalov's model projects to the projects by Tevyashov and Churnashov**

The first group of such materials dates back to 1760. At that time, due to the strengthening of the Qing Empire, the Eastern Siberian territories of Russia, located in the immediate proximity, were in an extremely vulnerable position<sup>(24)</sup>. The Qing Empire, which was a Manchurian state in East and Central Asia that has dominated China since as early as 1644<sup>(25)</sup>, posed a serious military threat. In the 1750s the Manchus defeated the Dzungar Khanate neighboring the Russian lands in Siberia<sup>(26)</sup>. The relations between Manchus and Russians also rapidly deteriorated at that time<sup>(27)</sup>. In this regard, the Russian authorities sought to take measures aimed at improving the security of the Russian possessions in Transbaikalia.

Since the middle of the 1750s Siberian governor Vasily Myatlev and his successor, Fyodor Soymonov, as well as the commander of the Selenginskaya fortress, brigadier Varfolomey Jacoby who managed border affairs in Transbaikalia, they all consistently expressed extreme concern about the vulnerability of Russian borders in the region. The forces available there were extremely small and they would not offer serious resistance in the event of a Chinese attack. These concerns were expressed in urgent requests of the Siberian au-

<sup>(22)</sup> Proskuryakova, "Planirovochnye kompozitsii".

<sup>(23)</sup> Shemelina, *Formirovaniye planirovochnoy struktury*.

<sup>(24)</sup> Vasilyev, *Zabaykal'skiye kazaki*, 65, 132-135, 153-155.

<sup>(25)</sup> Sergey Dmitriev, "Tsin" ["Qing"], in *Bol'shaya Rossiyskaya entsiklopediya*, vol. 34, (Moscow, 2017), 339-340.

<sup>(26)</sup> Ilya Zlatkin, *Istoriya Dzhungarskogo hanstva (1635-1758) [History of Dzungar Khanate]* (Moscow, Nauka, 1964), 323-387.

<sup>(27)</sup> Yevgeniy Besprozvannykh, *Priamur'ye v sisteme russko-kitayskikh otnosheniy. 17 - ser. 19 v. [Amur River Region in the System of the Russian-Chinese Relations. 17th - mid-19th cent.]* (Moscow, Nauka, 1983), 106-114; Slovtsov, *Istoricheskoye obozreniye*, 258-279.

thorities to the Senate to strengthen the defense of the Transbaikalian frontiers by increasing the number of troops and building fortifications. The latter is of particular interest to us<sup>(28)</sup>.

Having considered these formal requests, the Senate approved the concept of the project, according to which it was planned to build fortresses and redoubts on the Nerchinskaya and the Selenginskaya lines and under their cover to resettle the soldiers (together with their families) of the four land militia regular horse regiments<sup>(29)</sup>. In the autumn of 1760, this concept received the highest approval of empress Elizabeth I (the daughter of Peter I)<sup>(30)</sup>.

That was the starting point of the project development connected with the name of general feldzeugmeister<sup>(31)</sup> count Petr Shuvalov<sup>(32)</sup> who was an outstanding statesman and military actor of 18th century Russia. Shuvalov's project we researched was created in 1760 and compiled in the form of the *Instruction*<sup>(33)</sup> addressed to the chief engineer of the team of engineering and artillery officers seconded to Transbaikalia to identify the areas most suitable for the construction of fortresses on the Nerchinskaya and the Selenginskaya defensive lines, and the subsequent creation of their projects<sup>(34)</sup>.

Our research results on Shuvalov's *Instruction* were presented in our previous articles<sup>(35)</sup>. In the present paper, we again refer to this *Instruction*, but this time submitting new data on the prehistory of its creation and subsequent implementation. In addition, our studies of Shuvalov's *Instruction*, so far as we know, are the only ones that are dedicated to a detailed study of this document. At the same time, it should be noted that Shuvalov's *Instruction* appears in Stanislav Andriaynen's monograph<sup>(36)</sup>, where this document is mentioned among other 62 Shuvalov's projects and only in passing without any analysis. Besides, the text of the *Instruction* is reproduced in the collective work "Urban planning of Siberia"<sup>(37)</sup> and in the writing of Fyodor Laskovsky<sup>(38)</sup>, the author of the second half of the 19th century. However, the document was not investigated either. In this regard, we have to rely mainly on the results of our researches, continuing our series of articles about Shuvalov's *Instruction* and the Transbaikalia fortresses.

Basing all his activities "on the rational fundamentals"<sup>(39)</sup> and focusing on the full achievement of the mission goals, Shuvalov sought to create the most comprehensive guidelines for the seconded engineers prescribing in advance answers to a wide variety of questions that could potentially arise in the course of the task. In the fifteen paragraphs of the text, Shuvalov provided clear guidance not only on a selection of sites for the placement and design of fortresses but also on their exploiting including personnel, social and other aspects. What is particularly interesting is that Shuvalov attached to the text of the *Instruction*

<sup>(28)</sup> *Senatskiy arkhiv v 15 tomah [Senate Archives in 15 vol.]*, vol. 9 (St.Petersburg: Senatskaya tipografiya, 1901).

<sup>(29)</sup> *Senatskiy arkhiv*, vol. 11: (St.Petersburg: Senatskaya tipografiya, 1904), 437-441.

<sup>(30)</sup> Vasilyev, *Zabaykal'skiye kazaki*, 154-155.

<sup>(31)</sup> General feldzeugmeister – a head of the Chancellery of the Main Artillery and Fortification in the 18th century Russia. For more details, see: I. Ganichev, "General Feldzeugmeister" in *Bol'shaya Rossiyskaya entsiklopediya*, vol. 6 (Moscow, 2006), 543.

<sup>(32)</sup> Petr Shuvalov (1711-1762) – Count. Senator. Vice president of the Military Chamber. Chief of the Armory Office. Field marshal. From 1756 to 1762 Shuvalov served as general feldzeugmeister. Under the direction of Shuvalov several forms of artillery shells were developed, including the "unicorn". In 1757 he initiated the creation of the Commission for the Description of Russian Fortresses. In 1758, on the initiative of Shuvalov, the integrated Artillery and Engineering School was founded. For more details, see: Stanislav Andriaynen, *Imperiya proyektov: gosudarstvennaya deyatel'nost' P.I. Shuvalova [Empire of Projects: State Activity of P.I. Shuvalov]* (St.Petersburg, SPbGUEF, 2011).

<sup>(33)</sup> *Instruction* – a type of official documentation regulated duties of officials in the 18th century Russian Empire. For more details, see: Mariya Ilyushenko, *Istoriya deloproizvodstva v dorevol'yutsionnoy Rossii [History of Office Management in Pre-Revolutionary Russia]* (Moscow, RGGU, 1993).

<sup>(34)</sup> Moscow, Russian State Archive of Ancient Acts, coll. 248, series 113, file 1527.

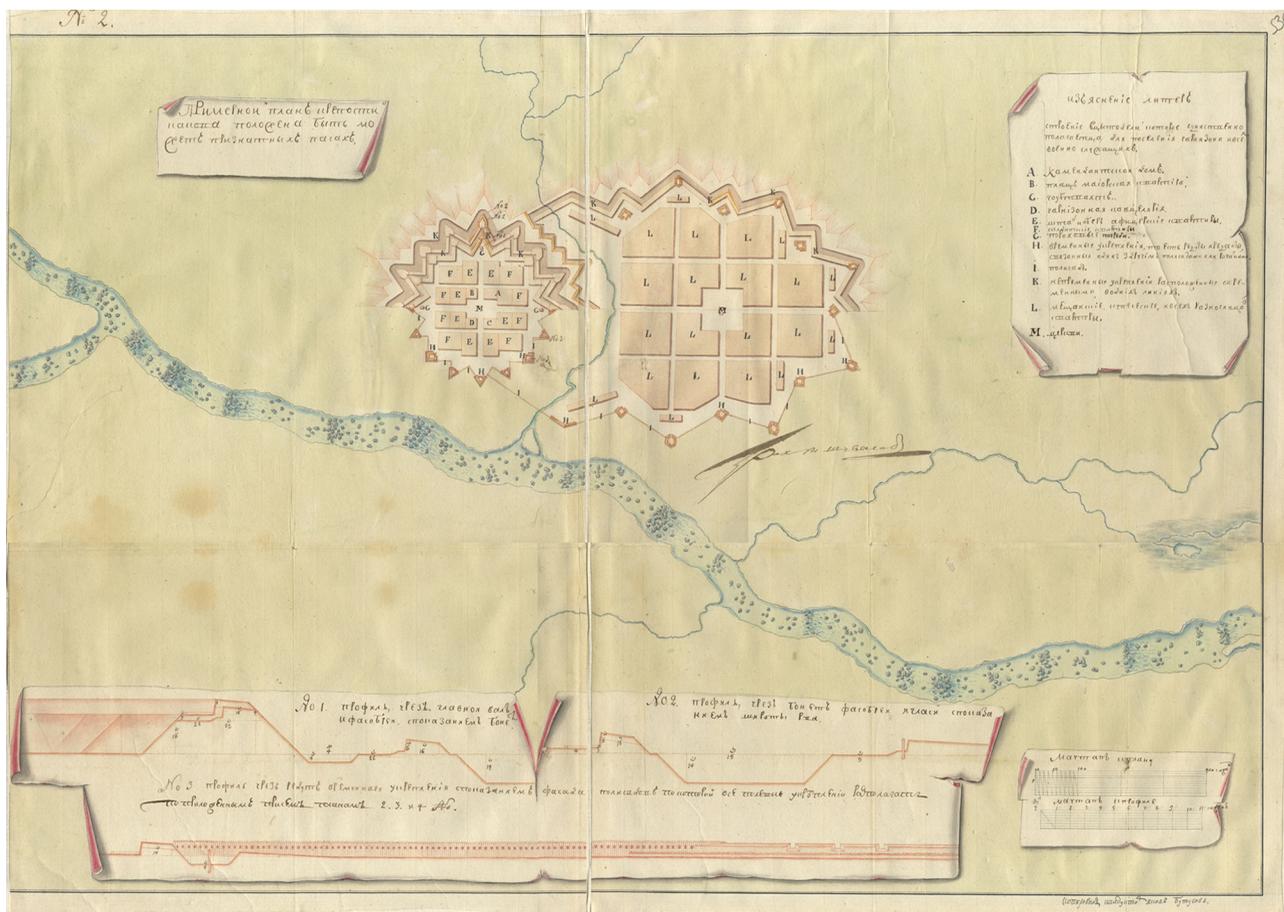
<sup>(35)</sup> Daria Shemelina, "Count P. Shuvalov's 1760 *Instruction* on Designing Fortresses on Defensive Lines in East Siberia: Between Prescription and Flexibility", *Revista de História da Arte* 13: Cidade (in)defesa, (2018), 140-157, [https://institutedehistoriadaarte.files.wordpress.com/2018/11/rha\\_13-140-157.pdf](https://institutedehistoriadaarte.files.wordpress.com/2018/11/rha_13-140-157.pdf); Daria Shemelina, "Instruktsia 1760 g. grafa P. I. Shuvalova: kompleks arkhivnykh dokumentov o krepostyah 'evropeyskogo tipa' v Vostochnoy Sibiri" [Instruction of Count P. I. Shuvalov of 1760: a Collection of Archive Documents regarding "European Type" Fortresses in East Siberia], *Arkhitekturnoye nasledstvo* 58, (2013), 104-122.

<sup>(36)</sup> Andriaynen, *Imperiya proyektov*, 149, 156, 170, 215, 224-239.

<sup>(37)</sup> *Gradostroitel'stvo Sibiri*, 684-687.

<sup>(38)</sup> Fyodor Laskovsky, *Materialy dlya istorii inzhenernogo iskusstva v Rossii [Materials for the History of Engineering Art in Russia]*, part 3, appendix (St.Petersburg, Tipografiya Imperatorskoy Akademii Nauk, 1865): 731-741.

<sup>(39)</sup> Andriaynen, *Imperiya proyektov*, 83.



1.1  
Project of a fortress "near important pathways". 1760.  
(Moscow, Russian State Archive of Ancient Acts, coll. 248,  
series 160, file 1893)

the four "estimated projects" ("primernyye prozhekty") that he developed for different variants of landscape, which, it seemed to him, engineers could find while working in Transbaikalia – these are the project of a fortress "for defending inner settlements from enemy raids" (or "small" fortress)<sup>(40)</sup>, the project of a fortress "near important pathways"<sup>(41)</sup> [Fig. 1.1], the project of a fortress "near a sea gulf"<sup>(42)</sup> [Fig. 1.2] and the project of a fortress "near a river"<sup>(43)</sup>. In fact, these were model projects.

It should be stressed that Shuvalov, as it can be seen from the content of the Instruction as well as from the analysis of his curricula vitae<sup>(44)</sup> drew up the Instruction when he was in St. Petersburg, then the capital of the Russian Empire, which was about 7 000 km away from the Nerchinskaya and the Selenginskaya defensive lines. Probably, realizing his detachment from reality and the purely theoretical nature of his projects drawn up by him in the "sterile conditions" of St. Petersburg, Shuvalov had to move away from strict prescription in favor of a certain flexibility and to allow the engineers to act creatively<sup>(45)</sup> – he ordered them to start developing their own projects based on the characteristics of the local landscape when they arrived in Transbaikalia. However, they had to do this based on Shuvalov's model projects attached to the Instruction.

In our previous studies, we conducted a comparative analysis of Shuvalov's projects and compared its results with the content of the Instruction text<sup>(46)</sup>. As a result, it was found that Shuvalov's model projects, which he proposed to the engineers as a starting point, expressed in graphic form what he had formulat-

<sup>(40)</sup> Moscow, Russian State Archive of Ancient Acts, coll. 248, series 160, file 1892.

<sup>(41)</sup> *Ibidem*, file 1893.

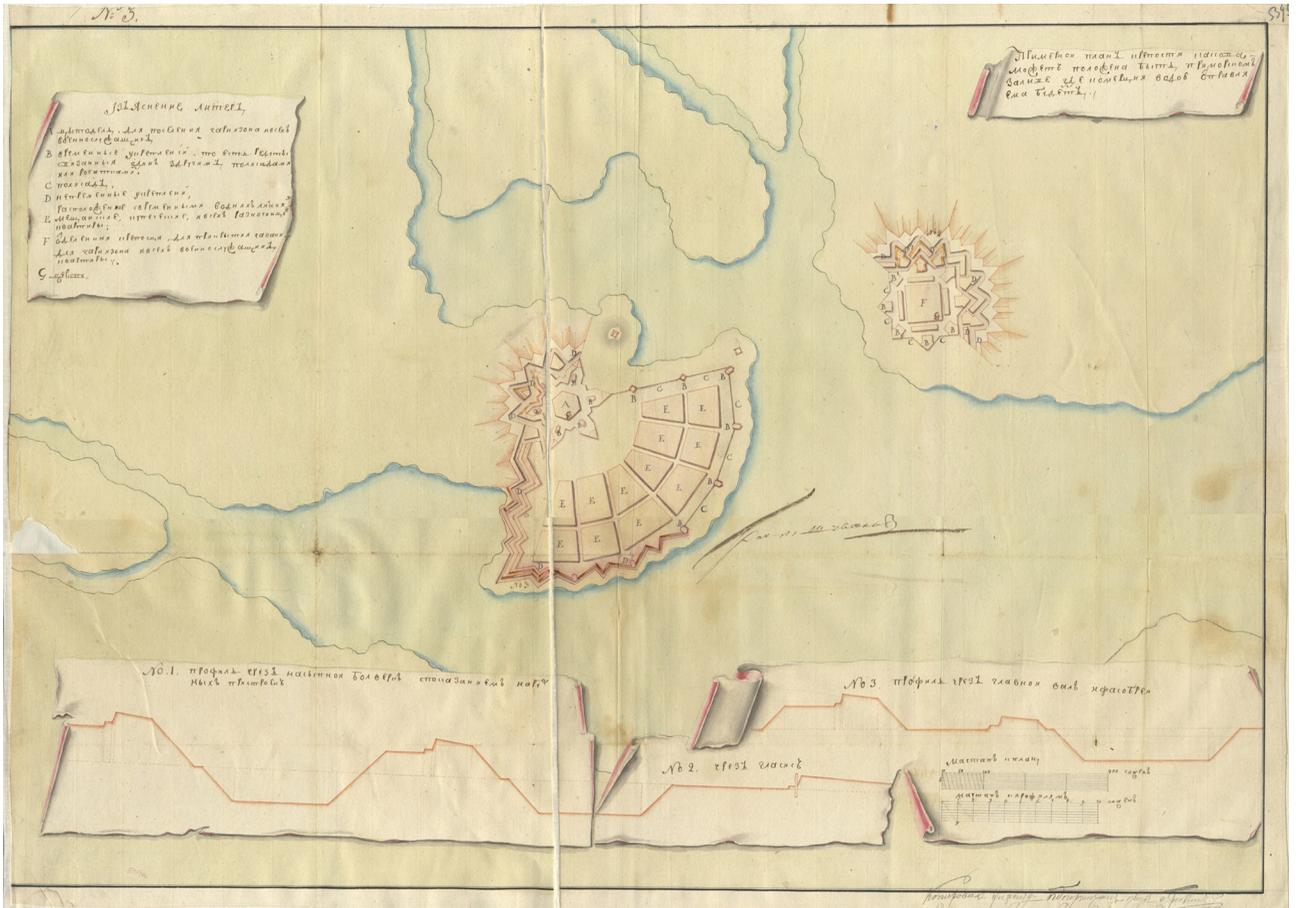
<sup>(42)</sup> *Ibidem*, file 1894.

<sup>(43)</sup> *Ibidem*, file 1895.

<sup>(44)</sup> Andriaynen, *Imperiya proyektov*, 13-68.

<sup>(45)</sup> This balance of Shuvalov between prescription and flexibility was examined in our work: Daria Shemelina, "Count P. Shuvalov's 1760 Instruction on Designing Fortresses on Defensive Lines in East Siberia: Between Prescription and Flexibility".

<sup>(46)</sup> Daria Shemelina, "Instruksia 1760 g. grafa P. I. Shuvalova".



ed in the text, namely, the basic principles of designing fortifications. They were the ones that the seconded engineers ultimately had to follow when drawing up their projects on the ground. These principles concerned both the fortification and the planning features of fortresses.

The first principle was that the projects of forts must be developed strictly “according to the rules of fortification” (“*po regulu fortifikatsii*”). In the professional terminology of the 18<sup>th</sup> century Russian military engineering this meant following the rules of the European military architecture. Obviously, by that Shuvalov meant an appeal to theoretical developments on fortification. In the model projects, this principle was expressed as follows. The projects provided for the construction of earthen forts, regular in plans, intended for resistance to artillery weapons. The defense systems of fortresses were based on the use of both the tenaille trace (fortress “near important pathways” and fortress “near a river”) and the bastion trace (in the “small” fortress and the “citadel” of the fortress “near a sea gulf”). At the same time, the fortresses with tenaille trace were supplemented by bonnets and *fausse-braies*.

Another Shuvalov’s principle was to design a civic development strongly according to the regular plan both within and outside fortresses. In this regard, he also stated that this should be implemented properly for barracks, powder magazines, arsenals, armories, provision warehouses as well as other buildings. In the model projects, Shuvalov presented this principle through centric compositions, which were characterized by geometrism and ordering.

1.2  
Project of a fortress “near a sea gulf”. 1760.  
(Moscow, Russian State Archive of Ancient Acts, coll. 248,  
series 160, file 1894)

According to Shuvalov, the design of fortresses should begin with drawing up a “route map” (“marshrutnaya karta”), which was a map of the area through which the lines were planned to pass. After that, it was advisable to start to draw up “true plans” (“vernyye plany”) representing the surroundings. Then, Shuvalov ordered to draw up longitudinal and transverse profiles for each place where it was supposed to build a fortress, and only after producing all these documents, it was allowed to proceed to develop projects. The finished project documentation had to be delivered to St. Petersburg for approval.

As the researcher of the beginning of the 20<sup>th</sup> century Afinogen Vasilyev points out<sup>(47)</sup>, the mission to become the chief engineer of the team of officers sent to Transbaikalia to strengthen the Nerchinskaya and the Selenginskaya lines with fortresses was entrusted to prime major Yakov Tevyashov. As it was prescribed by Shuvalov’s Instruction, upon completion of work on the projects of fortresses, Tevyashov took the finished graphic documents from Transbaikalia to St. Petersburg. However, first he delivered them to Tobolsk, the West Siberian city and then the administrative center of the Siberian province, for presentation to the Siberian governor Denis Chicherin. After coordinating his further trip with the governor, Tevyashov went to the capital for approval of the projects. This happened only at the beginning of 1764, that is, four years later after the approval of the concept of strengthening the Transbaikalian borders by empress Elizabeth I, the issuance of the relevant decree on the seconding engineers to Transbaikalia and the creation of the Instruction in 1760. The set of documents which Tevyashov had to submit for approval in St. Petersburg included the projects of 10 fortresses and 52 redoubts, with which the engineers’ team proposed to reinforce the Nerchinskaya and the Selenginskaya lines.

The implementation of the Shuvalov-Tevyashov project was associated with various kinds of difficulties. Since its inception, the project was subjected to various transformations in favor of reducing the cost of its realization. Perhaps this was partly due to the fact that by the time the project was submitted to the Senate in 1764, those whose implementation largely depended on – empress Elizabeth I (in 1761) and count Shuvalov (in 1762<sup>(48)</sup>) – had already passed away. So, having considered the Shuvalov-Tevyashov project, the Senate came to the conclusion:

[...] Many fortresses and redoubts were assigned unnecessarily, that the projects were drawn up uneconomically, that the engineers, not knowing the circumstances that caused the construction of more fortresses, observed only one thing – to construct fortresses according to the rules of fortification<sup>(49)</sup>.

<sup>(47)</sup> Vasilyev, *Zabaykal'skiye kazaki*, 169.

<sup>(48)</sup> Andriaynen, *Imperiya proyektov*, 37.

<sup>(49)</sup> Vasilyev, *Zabaykal'skiye kazaki*, 170.

Unfortunately, we have not yet been able to detect projects created by Tevyashov, so we can only rely on this quote. This characteristic tellingly shows that, on the one hand, the engineers sent to Transbaikalia developed their projects according to the principles of Shuvalov, which were discussed above, and probably fully took them into account, at least in terms of fortification. However, on the other hand, this also became the basis of their criticism from the Senate and the reason for the rejection of the projects. As a result, at the end of the consideration of the Shuvalov-Tevyashov project, the Senate decided to reduce the volume of construction in favor of the construction of simpler forts (apparently, it referred to wooden tower forts, that we consider belonging to the first period) and in favor of reducing the number of strongpoints on the defensive lines – it was decided to construct only four fortresses out of ten permanent forts (on the site of Kudarinskaya *sloboda*, nearby the Akshinskaya village, on the site of Tsuruhaytuevsky outpost, as well as to construct a fortress at the confluence of the Argun and Shilka rivers) and not all of the 52 redoubts were built, replacing them with the simplest “little *ostrogs*” (*ostrozhki*). In accordance with this reduction, it was planned to settle a smaller number of military personnel on the lines. However, even in a modified form, the implementation of the project was postponed due to the Seven Years’ War (1756-1763), on which the main attention and expenses of the state were focused.

The failure of the projects created by Tevyashov can probably be explained as follows. Shuvalov, being an ingenious and energetic person, was the author of more than six dozen projects of various fields<sup>(50)</sup>. Military engineering was no exception, and Shuvalov, who headed the Chancellery of Main Artillery and Fortification as general feldzeugmeister in 1756-1760, launched intense activity in this field. It is known that while holding this position, Shuvalov persistently hunted for foreign literature on fortification. Moreover, in the field of special literature, he sought to translate the latest into Russian, and he demanded that foreign languages be introduced into the training program for young military engineers in order that they could read European treatises on military architecture<sup>(51)</sup>. In this regard, it can be assumed that Shuvalov was fond of theorizing in the field of fortification, and probably through the text of the Instruction and the projects attached to it, he inspired Tevyashov to create projects, that were too difficult to implement in the conditions of Transbaikalia.

Meanwhile, the situation on the Chinese border of Russia in Transbaikalia continued to escalate<sup>(52)</sup>. Every now and then there was information about the dispatch of Chinese troops to various parts of the Siberian border. The commander of the Selenginskaya fortress, brigadier Jacoby again expressed extreme

<sup>(50)</sup> Andriaynen, *Imperiya proyektov*, 224-239, 109-170.

<sup>(51)</sup> *Ivi*, 98.

<sup>(52)</sup> Besprozvannykh, *Priamur'ye*, 106-115; Aleksandr Artem'yev, “Sekretnaya Nerchinskaya ekspeditsiya 1753-1765 gg. i arkhologicheskoye izucheniye Nerchinska” [“Secret Nerchinsk Expedition of 1753-1765 and Archaeological Study of Nerchinsk”], *Vestnik DVO RAN* 2, (1996), 51-56.

concern<sup>(53)</sup>. Empress Catherine II, who came to power in 1763, had to urgently address the issue of increasing troops in Siberia and providing the region with a sufficient amount of artillery.

In 1764, the Commission for the Defense of Transbaikalia began its work and decided to build the Akshinskaya, Selenginskaya and Kudarinskaya fortresses there, enclose them with a ditch, palisade, make earthen redoubts, and arm them with artillery<sup>(54)</sup>. Between the fortresses it was supposed to build *ostrogs*, i.e. strongholds similar to those that we consider as belonging to the first period. These measures taken by the Commission were part of the general legislative act on the establishment of border Cossacks on the Chinese border, approved by empress Catherine II in 1764<sup>(55)</sup>. It was this act that regulated the further course of development of the Nerchinskaya and the Selenginskaya defensive lines. At the same time, the course was chosen to ease the tension with China in a peaceful way. Besides, there was a warming of relations between the two States<sup>(56)</sup>. In this connection, the construction of fortresses was extremely sluggish (although they were already equipped with artillery pieces) and commander Jacoby, who always advocated the activation of the defense of the Russian borders in Transbaikalia, was removed from the management of border affairs of the region. They were reassigned to the Siberian defensive lines' chief, lieutenant-general Ivan von Springer, who had previously commanded only the lines of Western Siberia<sup>(57)</sup>.

Despite the calm that had settled on the border, there were those among the managers of Siberia who were aware that the pendulum of relations with China can swing in any direction and at any time. For instance, the deputy of the Transbaikalian city of Nerchinsk, knyaz Pavel Gantimurov, continued to insist on strengthening the Nerchinskaya and the Selenginskaya lines by constructing fortresses and relocating Cossacks there<sup>(58)</sup>. In 1766, in accordance with this idea, Gantimurov submitted to the Senate for consideration the second (after the Shuvalov-Tevyashov project) project for the construction of fortresses in Transbaikalia. It was only in 1769 when the Senate instructed the Military Collegium and the Collegium of Foreign Affairs to consider this development. In turn, the Collegiums redirected this project to the Siberian authorities. Finally, in 1772 the Irkutsk governor<sup>(59)</sup>, major-general Adam Bril (1767-1774) in collaboration with lieutenant-engineer Churnashov, redistributed the Cossacks along the border with China, and in connection with this, fortresses were established. In doing so, the ideas of Jacoby, Shuvalov, Tevyashov and Gantimurov which were discussed above, were taken into account. Notably, as stated in the writing of colonel Fyodor d'Auvray<sup>(60)</sup> (quoted after Vasilyev<sup>(61)</sup>), Churnashov outlined the construction of fortresses in precisely those places where they were initially supposed to be

<sup>(53)</sup> *Senatskiy arkhiv*, vol. 13, (St. Petersburg: Senatskaya tipografiya, 1909), 18-20, 23-25, 31-32.

<sup>(54)</sup> Vasilyev, *Zabaykal'skiye kazaki*, 185.

<sup>(55)</sup> *Senatskiy arkhiv*, vol. 13, op.cit, 23-25.

<sup>(56)</sup> Besprozvannykh, *Priamur'ye*: 106-115.

<sup>(57)</sup> Mikhail Akishin, Anatoly Remnev (eds.), *Vlast' v Sibiri, 16 – nach. 20 v. [Power in Siberia, 16th – early 20th cent.]* (Novosibirsk, Sova, 2005), 555.

<sup>(58)</sup> Vasilyev, *Zabaykal'skiye kazaki*; Alexandr Konstantinov, Natalia Konstantinova, *Istoriya Zabaykal'ya (s drevneyshikh vremen do 1917 g.) [History of Transbaikalia (from ancient times to 1917)]* (Chita, ZabGPU, 2002).

<sup>(59)</sup> *Irkutsk Governorate* – an administrative and territorial unit of the Russian Empire on the territory of Siberia, it existed from 1764 to 1917. For more details see: Lyudmila Karchanova, "Irkutskaya guberniya" ["Irkutsk Governorate"], in *Entsiklopediya Zabaykal'ya*, edited by Natal'ya Zhdanova (Chita, 1997 – ) <http://encycl.chita.ru/encycl/concepts/?id=9022> (last access: 1 Sept. 2020).

<sup>(60)</sup> Colonel Fyodor d'Auvray – in 1805, as a cartographer, accompanied the embassy to China of the Extraordinary and Plenipotentiary Ambassador of Russia in China Yuri Golovkin. For more details see: *Russko-kitayskiye otnosheniya v XIX v. [Russian-Chinese Relations in the 19th cent.]*, vol. 1: 1803-1807 (Moscow, Institute of the Far East RAS, 1995) [http://www.vostitit.info/Texts/Dokumenty/China/XIX/1800-1820/Russ\\_kit\\_otn\\_19\\_v\\_1/141-160/158.htm](http://www.vostitit.info/Texts/Dokumenty/China/XIX/1800-1820/Russ_kit_otn_19_v_1/141-160/158.htm) (last access: 1 Sept. 2020).

<sup>(61)</sup> Vasilyev, *Zabaykal'skiye kazaki*, 230.

built according to the Shuvalov-Tevyashov project. As a result, based on the existing fortresses and by constructing new ones, on the Nerchinskaya and the Selenginskaya lines eight distances (divisions) were established, along which it was planned to distribute the Cossacks<sup>(62)</sup>. They got their names from the names of eight large fortresses that separated one distance from another: Tunkinskaya (founded in 1772), Kharatsayskaya (founded in 1772), Troitskosavskaya (founded in 1728), Kudarinskaya (founded in 1764), Akshinskaya (founded in 1764), Chindant-Turukuyevskaya (founded in 1772), Novotsurukhaytuyevskaya (founded nearly 1764) and Gorbichenskaya (founded in 1772) fortresses. In addition, the distances also included 63 pickets (some of them were planned to be constructed of soil as redoubts, others – as wooden *ostrogs*). Thus, on the Nerchinskaya and the Selenginskaya lines which are more than 2,000 km long, a total of 71 fortifications were established, and the Russian Cossacks were settled nearby. Geographically, the system of Transbaikalian lines extended from the southern tip of Lake Baikal and further east, near the modern borders of Russia with Mongolia and China. The Yablonovy Range divided it into two parts: Western (the Selenginskaya line), and Eastern (the Nerchinskaya line). Finally, the structure of the Transbaikalian lines had been formed by 1777. The two earlier constructed fortresses were also associated with this defensive border system, although they were located outside the specified eight distances – we mean the Petropavlovskaya fortress on the Chikoyskaya spit (founded in 1726<sup>(63)</sup>) and the Selenginskaya fortress (reconstructed in 1727<sup>(64)</sup>). In the Selenginskaya fortress there was a military administrative center of Transbaikalia, from where the above-mentioned fortress commander, brigadier Jacoby managed border affairs.

### Graphic materials dating back to the 1770s

In the archives of the Russian Federation, we succeeded in finding the fixation plans of almost all (except for the Gorbichenskaya and Troitskosavskaya fortresses) of the listed large fortresses of Transbaikalia, which divided the Nerchinskaya and the Selenginskaya lines into distances<sup>(65)</sup>. These materials date back to the 1770s, i.e. to the time of the final formation of the lines. Some fixation plans (for example, the plan of the Kudarinskaya<sup>(66)</sup> and Akshinskaya<sup>(67)</sup> fortresses) are combined with the projects of already held or planned redevelopments. Probably, the documents found by us are precisely those graphic materials that were created by lieutenant-engineer Churnashov, a co-author of the Irkutsk governor Bril on redistribution of Cossacks along distances and the foundation of the Transbaikalian fortresses. This is confirmed by Churnashov's signature on the 1772 plan of the Akshinskaya fortress we found.

<sup>(62)</sup> This refers to the following distances: Tunkinskaya, Kharatsayskaya, Troitskosavskaya, Kudarinskaya, Akshinskaya, Chindant-Turukuyevskaya, Tsurukhaytuyevskaya and Gorbichenskaya. These distances are mentioned in: Vasilyev, *Zabaykal'skiye kazaki*; Konstantinov, Konstantinova, *Istoriya Zabaykal'ya*.

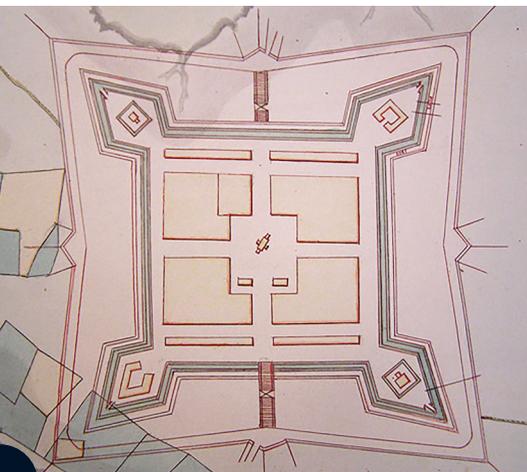
<sup>(63)</sup> Aleksandr Artem'yev, *Goroda i ostrogi Zabaykal'ya i Primur'ya vo vtoroy polovine 17 - 18 vv. [Cities and Ostrogs of Transbaikalia and the Amur Region in the second half of the 17<sup>th</sup> - 18<sup>th</sup> cent.]* (Vladivostok, Far Eastern Branch, RAS, 1999), 86-88.

<sup>(64)</sup> *Ivi*, 64-71.

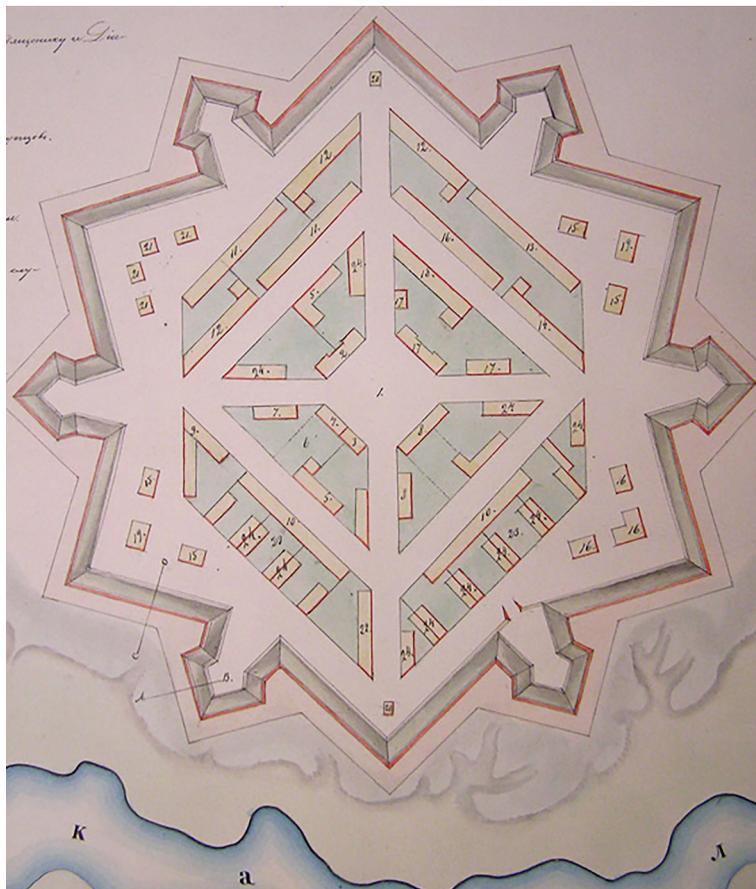
<sup>(65)</sup> We mean the plans of the following fortresses: *Tunkinskaya* (St. Petersburg, Russian State Archive of the Navy, from now on RSN coll. 3L, series 23, file 968, year 1772), *Kharatsayskaya* (Moscow, Russian State Military Historical Archive, from now on RSMHA, coll. 418, series 1, file 1110, year 1777), *Kudarinskaya* (Moscow, RSMHA, coll. 418, series 1, file 1093, year 1777), *Akshinskaya* (Moscow, RSMHA, coll. 418, series 1, file 1084, year 1772; St. Petersburg, RSN, coll. 3L, series 23, file 968, year 1769), *Chindant-Turukuyevskaya* (Moscow, RSMHA, coll. 418, series 1, file 1102, year 1777), *Novotsurukhaytuyevskaya* (St. Petersburg, RSN, coll. 3L, series 23, file 968, year 1772).

<sup>(66)</sup> Moscow, RSMHA, coll. 418, series 1, file 1093, year 1777.

<sup>(67)</sup> *Ivi*, file 1084, year 1772.



1.3  
Plan of the Tunkinskaya fortress. Fragment 1772.  
(St. Petersburg, Russian State Archive of the Navy, coll. 3L,  
series 23, file 968 )



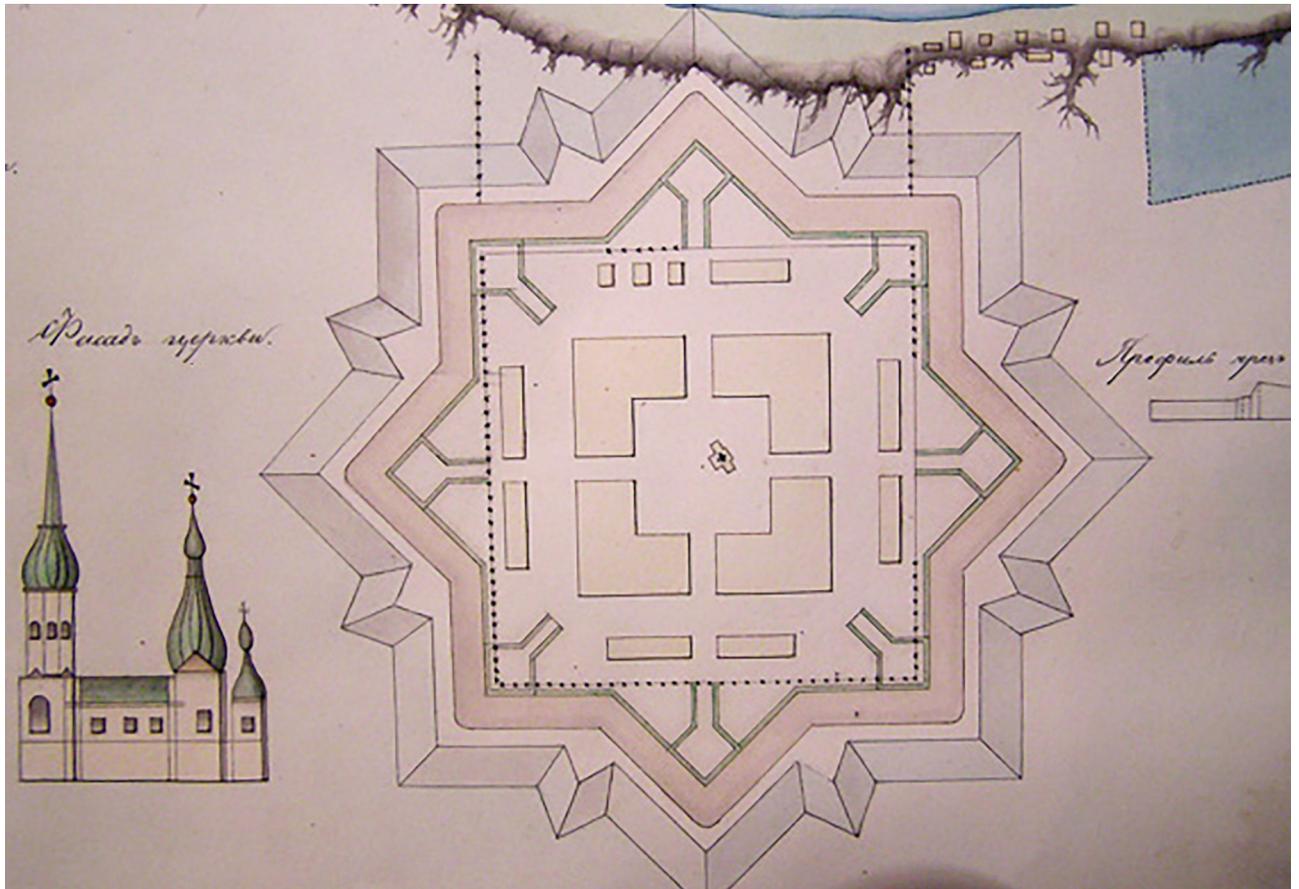
1.4  
Plan of the Novotsurukhaytuyevskaya fortress. Fragment  
1772.  
(St. Petersburg, Russian State Archive of the Navy, coll. 3L,  
series 23, file 968)

These plans, which have never been published before, can be conceptually incorporated into a second group of graphic documents upon which our research is based on. We also used the plan of the Petropavlovskaya fortress on the Chikoyskaya spit (no date) in our study<sup>(68)</sup>. Their analysis allows us to confirm our hypothesis that the Eastern Siberian linear fortresses were designed using the ideas of the European theory of fortification and the principles of rational urban planning thinking. Furthermore, based on our comparative analysis, it is possible to assert that Churnashov turned in his projects not only to the proposals for the location of forts that were expressed in the Shuvalov-Tevyashov project, as we mentioned according to the writing of d'Auvray, but also to the typical decisions of fortresses from this project.

#### *Fortification structure*

Let us consider the fortification structure of the fortresses presented in the Churnashov projects. They provided for the construction of earthen forts. Their structure was designed for the use of artillery weapons and corresponded to Shuvalov's principle from his Instruction to follow the rules of the European military architecture. The forms of the plans of all the East Siberian fortresses in the Churnashov projects were strictly regular. The Chindant-Turukuyevskaya, Kudarinskaya, Kharatsayskaya and Tunkinskaya [Fig. 1.3] fortresses were four-bastioned permanent forts. The Petropavlovskaya fortress had five bastions. The Novotsurukhaytuyevskaya fortress [Fig. 1.4] was a six-polygonal permanent fort and the Akshinskaya was a four-polygonal one [Fig. 1.5].

<sup>(68)</sup> Ivi, coll. 349, series 38, file 100.



The outworks did not differ in a variety and were the constructions in the form of ravelins. Only the Kudarinskaya, Chindant-Turukuyevskaya and Petropavlovskaya fortresses were reinforced by them.

For most of the fortresses, the use of a bastion trace was planned. The same trace was used in the model project of the five-bastioned “small” fort from Shuvalov’s Instruction. The exceptions were the Novotsurukhaytuyevskaya and Akshinskaya fortresses, where the tenaille trace was used. This, in our view, indicates certain parallels between the decisions applied in these forts and decisions presented in the model projects of the fortresses “near important pathways” [Fig. 1.1], “near a sea gulf” [Fig. 1.2] and “near a river” from Shuvalov’s Instruction where the same traces were used.

It should be noted that among the Transbaikalian fortresses, the tenailed Novotsurukhaytuyevskaya and Akshinskaya forts stand out. At the level of principles, the fortification of the Novotsurukhaytuyevskaya fortress had certain similarities with the developments of the representatives of the German fortification school. Despite the difference in the number of polygons, the structure of the Novotsurukhaytuyevskaya fortresses is closest to the concept of the 4-polygonal fort of Georg Rimpler presented in Philipp Christoph Lampe’s interpretation in his treatise<sup>(69)</sup> which, as we found out<sup>(70)</sup>, was sufficiently implemented in constructing fortresses along the Gor’kaya defensive line located in Western Siberia. Besides, the fortification structure of the Novotsurukhaytuyevskaya fortress, at the

1.5  
Plan of the Akshinskaya fortress. Fragment 1769.  
(St. Petersburg, Russian State Archive of the Navy, coll. 3L,  
series 23, file 968)

<sup>(69)</sup> Philipp Christoph Lampe, *Die in Bataille victorisirende Vestung* (Nurnberg, Christoph Weigel, 1738).

<sup>(70)</sup> Daria Shemelina, Tobias Büchi, “German fortification theory: diffusion into the architectural practice of building fortresses on the defense lines in Siberia in the 18th cent.”: report on the project funded by SNSF”, *Scholion. Bulletin der Stiftung Bibliothek Werner Oechslin* 10, (2016), 176-187.

level of principles, also has some similarities with fortification proposed in 1583 by Daniel Specklin in the project of the ducal town of Wolfenbüttel reinforced by the book collector Julius, duke of Braunschweig<sup>(71)</sup>. It is also possible to draw some parallels between the Novotsurukhaytuyevskaya fortresses and the tenailed five-polygonal fort Preussen designed in the 1720s by the Prussian engineer Gerhard Cornelius Walrave to enhance Stettin, the historical capital of Pomerania<sup>(72)</sup>. In terms of fortification, the Novotsurukhaytuyevskaya fortress is also close to the Norwegian fortress Vardhus<sup>(73)</sup>, as well as the Romanian fortress Arad, built according to the project of the Austrian general, engineer Ferdinand Philip von Harsch<sup>(74)</sup>. Both of these European fortresses have survived to this day.

The Akshinskaya fortress was a four-polygonal quadrangular regular earthen fort constructed with the use of tenaille trace. The salient angles of this fortress were strengthened by eight “bollwerks”. According to the project, the covert way should be completed with the footholds (place d’arms). Therefore, the fortification of the Akshinskaya fortress was significantly different from most of the Transbaikalian forts, the defense of which was based on the use of bastion trace. In our view, the Akshinskaya fortress is close to the concept of the polygonal fortification of the German military engineer Rimpler, who proposed quadrangular forts based on tenaille trace and placing bastions in the middles of curtains<sup>(75)</sup>. In the history of fortification, due to the lack of drawings in the writings of Rimpler, many interpretations of his concept are known. For example, the quadrangular tenailed fort from the manuscript treatise “Arithmetica Decimalis” (1680) by an unknown author<sup>(76)</sup>. It could be assumed with a high degree of certainty that the Akshinskaya fortress also belongs to this kind of interpretations. We believe that the project of the Akshinskaya fortress is the implementation of the project of the tenailed “detached little fortress” (“otdelennaya krepostsa”) presented on the project of a fortress “near a sea gulf” [Fig. 1.2] from Shuvalov’s Instruction.

#### *\_Planning structure*

The fortification decisions of the Transbaikalian fortresses were relatively diverse, but the planning structure of the main territories of the fortresses presented in Churnashov projects was based on a unified planning pattern. In one form or another, it was applied to all the above-mentioned Transbaikalian linear fortresses (except for the Novotsurukhaytuyevskaya fortress, [Fig. 1.4]). So it can be concluded that the planning decisions of the Transbaikalian permanent fortresses were characterized by typification. The applied planning pattern was characterized by regularity which was expressed throughout geometrism and

<sup>(71)</sup> Martha Pollak, *Cities at War in Early Modern Europe* (New York, Cambridge University Press, 2010).

<sup>(72)</sup> Grzegorz Bukal, “Prussian Star Forts in the 18th cent.”, *Fort: the international journal of fortification and military architecture* 39, (2011), 3-56.

<sup>(73)</sup> Giorgio Cacciaguerra, “La città fortificata di Vardhus”, in *Castelli e città fortificate. Storia recupero valorizzazione. Colloqui internazionali*, Palmanova/Gradisca, 3-4 Luglio 1989, edited by Aldo de Marco and Giovanni Tubaro (Università di Udine, Istituto di Urbanistica e Pianificazione, 1989), 383-388.

<sup>(74)</sup> Ioan Tuleu, “Cetatea Aradului”, PRO Urbe. Blogul Asociației pentru protecția patrimoniului urban al Aradului, <http://www.pro-urbe.ro/monumente/cetatea-aradului/> (last access: 12 March 2021).

<sup>(75)</sup> Daria Shemelina, Tobias Büchi, “German fortification theory”.

<sup>(76)</sup> Luxembourg, Musée Dräi Eechelen, Documentation Center of the Luxembourg fortress, Jordan Fund, *ms 13*.

orderliness. This fully corresponded to Shuvalov's principle from his Instruction "to design a civic development strongly according to a regular plan both within and outside fortresses".

The essence of the unified planning pattern used for the Akshinskaya [Fig. 1.5], Chindant-Turukuyevskaya, Kudarinskaya, Kharatsayskaya, Tunkinskaya [Fig. 1.3] and Petropavlovskaya fortresses was as follows – in the center of the main fortress territory, at the intersection of the two main and broadest streets a square almost quadrangular in shape was situated with a church in its middle. The main streets connected gates located in the middle of the opposite curtains. The corners of squares were blocked by L-shaped quarters so that it was possible to leave the squares only through the central streets located along the axes of the symmetry of the forts. Thus, the squares in the Transbaikalian fortresses were quite enclosed spaces. On the rest of the inner territory of the fortresses, there were few elongated barracks (for example, in the Kharatsayskaya and Akshinskaya fortresses) or several rows of extended residential and farm buildings (e.g. the Kudarinskaya and Chindant-Turukuyevskaya fortresses).

This unified planning pattern has characteristics similar to those shown in the model projects from Shuvalov's Instruction – in the project of a "small" fortress and the projects of fortresses "near important pathways" [Fig. 1.1] or "near a river". Despite the difference in their functions, their layouts were also based on a common strictly regular centric composition, the core of which was a quadrangular square formed by L-shaped quarters with a church in the middle.

The similarity of these two planning patterns indicates that Churnashov really turned in his projects to the model projects attached to Shuvalov's Instruction. It is interesting that such enclosed squares with L-shaped quarters on the corners were used in the development of the territory on the other side of the world – in the projects elaborated in the first third of the 18th century for the forts built in the French colony of Louisiana<sup>(77)</sup>.

It is worth noting that the use of the unified planning patterns organized based on an orthogonal street grid was peculiar not only of most linear fortresses of Transbaikalia. As the results of our research showed, this was also characteristic of the permanent fortifications of Western Siberia<sup>(78)</sup>. This fact allows us to talk about universal approaches to the design of linear forts that were common to the entire Siberia – both in western and in eastern parts of the region, unified regular planning compositions were used, in the centers of which there was a square with a church on it.

<sup>(77)</sup> Gilles-Antoine Langlois, "Architecture urbaine en Louisiane française : le fil invisible Vauban", in *Les cahiers du Réseau Vauban*, vol. 3: *L'influence de Vauban dans le monde*, Jean-Louis Fousseret, Michèle Virol, Philippe Bragard et. al. (eds.) (Besançon - Namur, Réseau des sites majeurs Vauban - Les Amis de la Citadelle de Namur, 2014), 105-118.

<sup>(78)</sup> Daria Shemelina, "Transformations in the shadow of war: reconstruction of the fortresses on the Siberian defensive lines (18th cent.)", in *Urban renewal and resilience. Cities in comparative perspective: proceedings of the 14th International Conference of the European Association for Urban History (EAUH)*, (Rome, 29 Aug. - 1 Sept. 2018) <https://eauh2018.comgs.it/> (last access: 3 Oct. 2018).

However, there is a certain difference. The planning pattern applied for the fortresses of Western Siberia was developed, as we assume<sup>(79)</sup>, based on the plan of the fortress-city Neuf-Brisach from the treatise by the engineer Bernard Forest de Bélidor “La science des ingénieurs...”<sup>(80)</sup> – in this planning pattern, the passageways to the adjoining streets were arranged in the corners of the squares. In contrast, in the Transbaikalia fortresses, the corners of the squares were blocked by L-shaped quarters, so that it was possible to leave the squares only through the central streets located along the axes of the symmetry of forts. Thus, the squares in the fortresses of Transbaikalia were more enclosed compared to the squares in West Siberian forts.

It should be noted that among the Transbaikalian fortresses, the tenailed Novotsurukhaytuyevskaya fortress stands out again [Fig. 1.4]. Its planning composition was also centric, but a different planning decision was used for this fort, developed without reference to that unified planning pattern on which the layouts of other Transbaikalian fortresses were based on. In the Novotsurukhaytuyevskaya fortress, at the intersection of the two main streets connecting opposite bastions, there was an almost quadrangular square with a church in its middle. The main and secondary streets divided the territory into eight quarters which can be conceptually grouped into two categories. The first category of quarters had a trapezoidal shape, they were located near the center of a fortress and restricted a quadrangular square. There were administrative, residential and public buildings, as well as the house of the fortress commander and “barracks for visiting merchants”. The second category of quarters, located further from the center, was characterized by quarters the plan shape of which was close to parallelograms. There were household buildings (for example, stables and food warehouses), soldiers’ barracks, medical institutions, as well as territories for civil buildings. Outbuildings (such as powder magazines and forges) were placed on the periphery of the fortress.

### Conclusion

From the above, it is obvious that, despite the skepticism of some researchers, the very fact of the existence of the defensive lines in Transbaikalia in the 18th century is in no doubt, and the fortresses that were part of them were a real result of the complex and longstanding design process.

The comparative analysis allows to draw a line of succession – from the 1760 model projects created by count Shuvalov to the projects of prime major Tevyashov who acted according to Shuvalov’s Instruction, and further to the projects of lieutenant-engineer Churnashov inspired by the basics of the project pro-

<sup>(79)</sup> *Ibidem*.

<sup>(80)</sup> Bernard Forest de Bélidor, *La science des ingénieurs dans la conduite des travaux de fortification et d'architecture civile* (Paris, C. Jombert, 1729).

posals of his predecessors and used them in his own projects of the fortresses of the Nerchinskaya and the Selenginskaya defensive lines. Further search for a deeper appreciation of the linkages between the listed projects, as well as the identification of relevant graphic materials, will form the basis for our subsequent research.

Our analysis of the two groups of the written and graphic documents dated to 1760 and the 1770s, which we found in the archives of the Russian Federation, clearly allows us to confirm our hypothesis that the East Siberian linear fortresses were designed based on the ideas of the European theory of fortification. For most of the Transbaikalian fortresses, the use of a bastion trace was planned, but for some forts (Novotsurukhayuyevskaya and Akshinskaya forts) a tenail trace was applied according to the developments of the German fortification school. The principles of rational urban planning thinking were used in the projects. Typification, regularity and forethought were peculiar to the fortification and planning decisions of the fortresses. In this regard, it can also be argued that there are universal approaches to the design of linear forts that were common to the whole of Siberia. In addition, it can be stated that the experience of constructing fortresses along defensive lines in Western Siberia was transferred to Eastern Siberia.

The researcher of the history of the architecture of the Far East professor Nikolay Kradin, studied the remains of the Akshinskaya fortress, has quite rightly observed that the fortresses of Transbaikalia “are of great scientific interest and historical value as a rare example of the Russian fortification art of the 18<sup>th</sup> century”<sup>(61)</sup>. Unlike the wooden tower strongholds of the first period, several dozens of which were built in the 17<sup>th</sup> - early 18<sup>th</sup> centuries in Transbaikalia, the linear fortresses of the Nerchinskaya and the Selenginskaya lines are unique and only examples of “European-type” fortifications on the vast area from Lake Baikal to the Pacific Ocean. We hope that our study makes some contribution to return these fortifications to the research field of historians of architecture and will serve as a basis for studying them further.

<sup>(61)</sup> Kradin, “Zabaykal’skiye fortetsii”, 209.