

## Resumo

Este trabalho apresenta os resultados do estudo da *Instrução* sobre a criação das linhas defensivas de Nerchinskaya e Selenginskaya na Sibéria Oriental, um conjunto único de documentos (texto e desenhos com projectos-tipo de fortalezas) conservados no Rossiyskiy Gosudarstvenniy Arhiv Drevnih Aktov (RGADA, Moscovo). A *Instrução* era dirigida aos engenheiros destacados para identificar as áreas adequadas para as fortalezas e elaborar os respectivos projectos. O documento foi criado em 1760 pelo general Feldzeugmeister Conde Petr Shuvalov. A distância de Shuvalov, afastado dos locais de construção em milhares de quilómetros, fez com que ele fornecesse aos engenheiros directrizes rígidas para a criação das linhas de fortificação. Mas a incerteza total sobre o que poderia ser enfrentado pelos engenheiros na Sibéria Oriental, bem como os desafios colocados ao desenvolvimento urbano dos territórios próximos das futuras fortalezas, exigiam que Shuvalov fosse também flexível. Assim, esses objectivos e factores obrigaram o autor da *Instrução* ao equilíbrio entre prescrição e flexibilidade. ●

## Abstract

The work presents the results of studying the *Instruction* on the creation of the Nerchinskaya and the Selenginskaya defensive lines in East Siberia, a unique set of documents (the text and the model projects of fortresses) stored in the Russian State Archive of Ancient Acts (RGADA, Moscow). It was addressed to the engineers seconded to identify the areas suited for the construction of forts and to develop its projects. The document was created in 1760 by the General Feldzeugmeister Count Petr Shuvalov. The remoteness of Shuvalov, who was thousands of kilometers away from the construction sites, meant that he had to provide the engineers with strict guidelines for the creation of linear fortifications. But the total uncertainty of what exactly the engineers could be faced with in East Siberia and the challenges to the urban development of the territories neighbouring the future fortresses required Shuvalov to be flexible. Thus, these aims and factors obliged the author of the *Instruction* to balance balance between prescription and flexibility. ●

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# COUNT P. SHUVALOV'S 1760 INSTRUCTION ON DESIGNING FORTRESSES ON DEFENSIVE LINES IN EAST SIBERIA: BETWEEN PRESCRIPTION AND FLEXIBILITY

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## Introduction

In the 18<sup>th</sup> century, on the borders of Russia in Siberia, an ambitious project was being carried out to create defensive lines, which were an integral part of the Russian linear defensive system. In Western Siberia, the Irtyshskaya, Gorkaya and Kolyvano-Kuznetskaya lines were built (their construction had begun in the first half of the 18<sup>th</sup> century [Shemelina 2010]); the lines for East Siberia were also designed (in the second half of the 18<sup>th</sup> century). These fortification complexes stretched for hundreds of kilometres from the Urals to the East to include dozens of forts of various strengths, ranging from fortresses to redoubts. From the 19<sup>th</sup> century to the present, in Russian studies on the history of the Siberian Cossack Army and on the history of Siberia, these strongholds are designated as “linear” (“lineynye”) fortifications (see, for example, Ogurtsov 1990, 21-22; Slovtsov [1844] 2012, 407; IA00. coll. 366, series 1, file 91; Putevoditel’... 1891, 1-20, cited in IA00. coll. 2200, series 1, file 35, part 3). In the construction of the defensive lines, on the one hand,

the traditional Russian experience of building extended fortification complexes – “storozhevye” lines, 15<sup>th</sup>–17<sup>th</sup> centuries (Buseva-Davydova and Godlevskiy 1994) was used; on the other, the forts on the defensive lines were built with a focus on resistance to firearms, in accordance with the rules of European fortification of the 17<sup>th</sup>–18<sup>th</sup> centuries (Buseva-Davydova and Krasheninnikova 1995; Krasheninnikova 1976; Shemelina 2010). Thus, the Siberian linear fortresses were unique objects, the creation of which accumulated the Russian traditions of border protection and also the ideas of the European theory of fortification.

In our previous studies it has been shown that the design development of Siberian linear fortresses was carried out using the fortification ideas of the European theorists – for example, the French military engineer Sébastien Le Prestre de Vauban and the German theorist Georg Rimpler (Shemelina 2010; 2014; Shemelina and Büchi 2016). We believe that the channel through which this knowledge was transferred to Russian military architecture were the European treatises on fortification. Already in the times of Peter the Great, on the initiative of Tsar himself, the works of famous European authors on fortification were translated into Russian (Bykova and Gurevich 1955; Dutov and Lyutov 2007): the writing about G. Rimpler's military architecture (*Rimplerova manira... 1708*)<sup>1</sup>, L. Ch. Sturm (*Sturm 1709*), M. van Coehoorn (*Coehoorn van 1709*), F. Blondel (*Blondel 1711*) and de Cambray's treatise about “Vauban's fortification” (*Cambray de 1724*). The treatises of G. A. Böckler and J. J. Werdmüller were also translated but remained as manuscripts in the private library of Peter the Great and were never printed (Lebedeva 2003, 142–145, 134–135; Hoteyev 2008, 152). Furthermore, the books by the Austrian military engineer E. F. von Borgsdorff (*Borgsdorf von 1708*; *Borgsdorf von 1709*) written in Russian and German were published at that time.

There were concrete factors that led to the strengthening of Russia's defence capabilities in Siberia through the construction of the defensive lines. Until the end of the 18<sup>th</sup> century, Siberia was a region of heightened geopolitical tension (Okladnikov 1968, 25–55, 181–198; Nikol'skiy et al. 1902, 100–116). The reasons for this stemmed from the disputes between the Russian Empire and the neighbouring states of the nomadic and semi-nomadic peoples across the territories in the south of Siberia. These states, well-organized, equipped with artillery and firearms, and in possession of their own foundry and cannon manufacturing, represented a dangerous power striving to eliminate Russian mines, towns and settlements in Siberia (Zlatkin 1964, 319–464). In the first half of the 18<sup>th</sup> century, the threat emanated from the Dzungar Khanate – an independent state of western Mongolian feudal lords. In the second half of the same century, the menace was associated with the strengthening of the Qing Empire. In the 1750s the Manchus (who had dominated China since as early as 1644) defeated the Dzungar Khanate. The relations between Russians and Manchus were characterized by gradual deterioration that peaked in the 1760s (Akishin et al. 2005, 107, 320–321; Artem'yev 1996, 51–54; Besprozvannykh 1983, 103–106).

In this situation, the East Siberian territories of Russia located in close proximity to the Qing Empire were the most vulnerable. Therefore, the Russian authorities

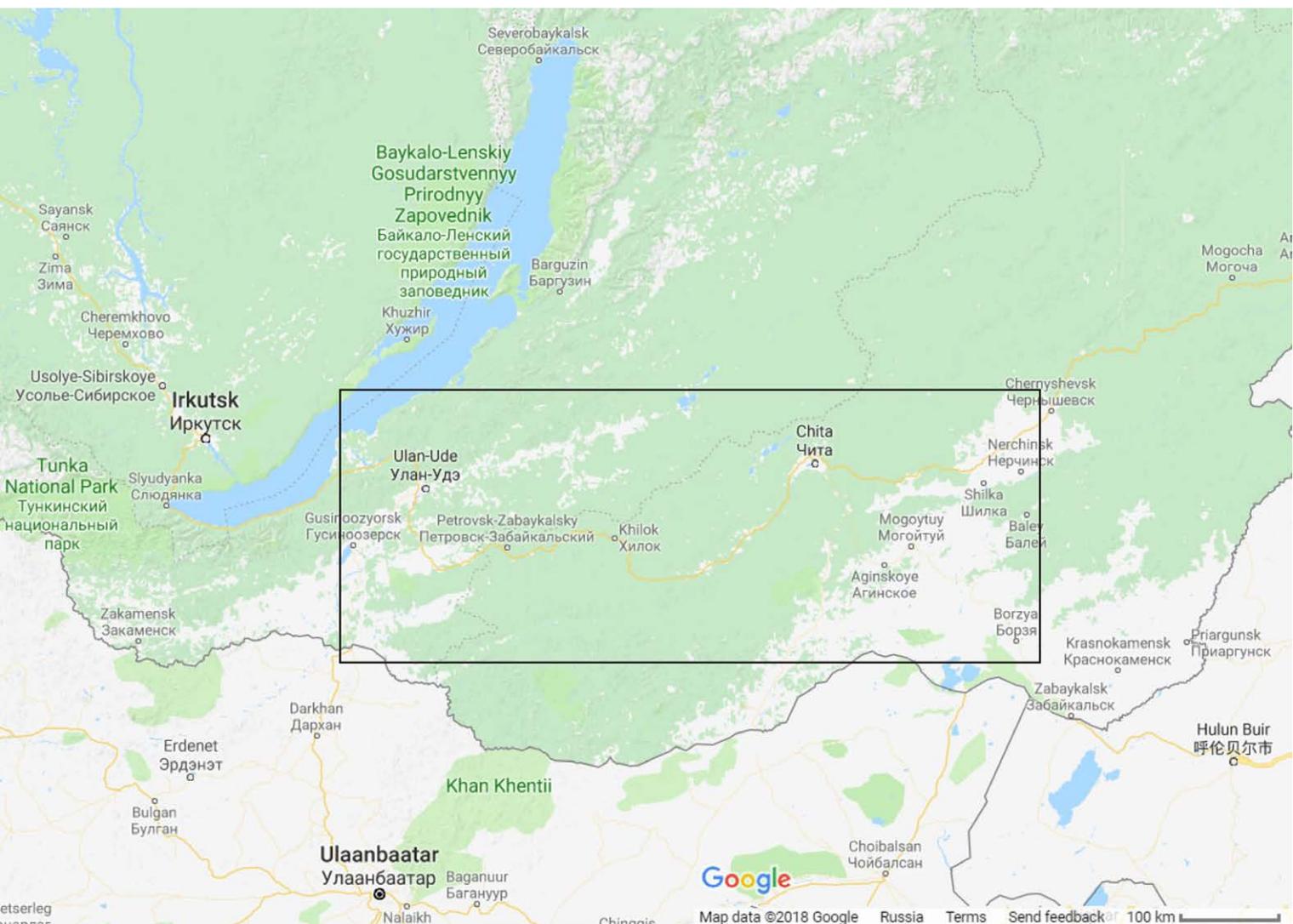
<sup>1</sup> During our previous research (Shemelina and Büchi 2016, 181–183) it was revealed that *Rimplerova manira o stroenii krepostey* (Moscow: Moskovskiy Pechatniy dvor. 1708) is the translation of Philipp Christoph Lampe's treatise *Die in Battaille victorisirende Vestung* (Vienna: Susanna Christina Cosmerovinus. 1691).

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Fig. 1 – The part of Transbaikalia region in East Siberia where the Nerchinskaya and the Selenginskaya defensive lines intended to be placed (marked with rectangle). Google Maps. Accessed February 3 2018, <https://www.google.ru/maps/@51.5437737,112.0310416,6.74z?hl=en>.

<sup>2</sup> *Instruction*, in the Russian Empire in the 18th century, was a type of official and business administrative documentation intended to regulate the responsibility of an official to perform their duties. A decree or report was generally attached to the *Instruction* (Gauch 2013, 228).

<sup>3</sup> Shuvalov, Petr Ivanovich (1711, Vyborg – 1762, St. Petersburg) Russian statesman and military actor. Count (since 1746). Adjutant-General (1746). Senator (1744). Vice President of the Military Chamber (1758-1760). Chief of the Armory Office (1757-1761). From 1756 to 1762 Shuvalov served as General Feldzeugmeister, heading the Chancellery

endeavored to increase the safety of these areas. Some of such efforts are reflected in the *Instruction*<sup>2</sup> on the creation of the *Nerchinskaya* and the *Selenginskaya* defensive lines. Judging by the names of these lines, they had been intended for the areas of the Nercha and Selenga rivers in Transbaikalia, which is a region of East Siberia (fig. 1). It should be noted that the Nerchinskaya and the Selenginskaya lines are still the most unstudied part of the Russian linear defensive system (Shemelina 2013, 104-105). The *Instruction* was issued in 1760 by the remarkable statesman and military actor of the 18<sup>th</sup> century in Russia, General Feldzeugmeister Count Petr Ivanovich Shuvalov<sup>3</sup>. The document was addressed to the engineers, seconded to East Siberia to identify the areas best suited for the construction of fortresses as well as to create the projects of these forts. That is why the *Instruction* consists of not only the text (RGADA, coll. 248, series 113, file 1527)<sup>4</sup>, but also, which is particularly significant,



of the model projects of fortresses based on the European theory of fortification (RGADA, coll. 248, series 160, files 1892, 1893, 1894, 1895).

It is important to point out that Shuvalov, as can be deduced from context and from the analysis of Shuvalov's *curricula vitae* (Andriaynen 2011, 13-68), drew up the *Instruction* while he was staying in St. Petersburg, then the capital of the Russian Empire, located about 7000km away from the Nerchinskaya and the Selenginskaya defensive lines. The study of the *Instruction* offers insights into the prescriptive nature of this document. Within the fifteen paragraphs, Shuvalov provided clear guidance on how exactly the seconded engineers on a mission must operate. The remoteness of Shuvalov from the construction sites meant that he had to provide the engineers with directives on dealing with the wide variety of difficulties that they may have encountered in the course of their work in East Siberia. At the same time, the total uncertainty of what the engineers could face in this outlying area required Shuvalov to not only be categorical but also flexible.

The materials investigated in this article provide valuable insights into the culture of architectural engineering of Russia in the 18<sup>th</sup> century, the technology of the design of the fortification objects, the broad range of responsibilities assigned to military engineers and the principles of rationalism which they refer to in their creative work<sup>5</sup>.

## From the project of a defensive line to the project of a fortress

On starting a mission, the engineer team first had to go to the city of Tobolsk, in Western Siberia, the administrative centre of the Siberian province, to put themselves at the disposal of the Governor F. I. Soymonov. Only then were the seconded engineers supposed to go to East Siberia, directly to the area where the Nerchinskaya and the Selenginskaya lines were to be created.

Upon arrival, the engineers had to choose the sites for the construction of fortresses and plot them on a "road map" ("marshrutnaya karta"), which was a map of the area through which the lines were planned to go. After that, Shuvalov ordered the division and allocation of the engineers according to the sites chosen for construction and the drawing up of the "true plans" ("vernnyye plany") representing the surroundings, within a three-verstas<sup>6</sup> radius for the large fortresses and a two-verstas radius for the small forts – in modern terms, the engineers had to draw the situation plans. The ground surface profiles (cross and longitudinal) had to be attached to the "true plans".

Following this intelligence work, Shuvalov commanded the execution of "indispensable projects" ("nepremennyye prozhekty"), which were the projects of the permanent fortresses. This fragment is of a particular interest because here Shu-

of the Main Artillery and Fortification and holding one of the highest military posts possible during the Russian Empire. Field Marshal (1761-1762). Since the mid-1740s Shuvalov was one of the main political leaders in Russia. He created dozens of projects of national importance, including those related to the development of Siberia. Shuvalov greatly contributed to improving the organization, combat training and arming of the Russian artillery. In 1754 he proposed a project for the establishment of the first Russian military academy and submitted a memorandum report entitled "About military science" in which he summarized the advanced ideas. Under the overall direction of Shuvalov several forms of artillery shells were developed, including the field "secret howitzer" (1753) and the licorne (1757-1759). Shuvalov was one of the organizers of the Russian army in the Seven Years' War (1756-1763). 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 (since 1762 the Artillery and Engineering Noble Cadet Corps) was founded to train officers for the engineering and artillery divisions. Shuvalov was the Knight of the Orders of Saint Andrew the Apostle the First-Called (1753), Saint Alexander-Nevsky (1742), Saint Anna (1742), the White Eagle (Andriaynen 2011, 24-37; Bol'shaya rossiyskaya entsiklopediya 2005-2017; Biograficheskiy slovar'. Vysshniye chiny Rossiyskoy Imperii... 2017, 527; Voyennaya entsiklopediya 1912, 233-234).

<sup>4</sup> The original title of the textual part of the *Instruction* in Russian is: "Instruktsiya ... general'feldtseykhmeystra ... grafa Shuvalova glavnomu inzheneru komandirovannomu dlya opisaniya mest i prozhektirovaniya ukrepleniya po Nerchinskoy i Selenginskoy liniyam" (RGADA, coll. 248, series 113, file 1527).

<sup>5</sup> The detailed analysis of the historical context, political motivation and objective of developing Shuvalov's *Instruction* as well as the analysis of the projects of fortresses from this *Instruction* are provided in my previous work (Shemelina 2013).

<sup>6</sup> *Versta* is an ancient Russian linear measure equal to 1.06km.

<sup>7</sup> *Vorstadt* is from the German for "suburb, outskirts".

valov formulated a general approach to the design. Furthermore, this approach refers both to defensive qualities of fortresses and the planning qualities of their layouts. The first requirement was that the projects of forts must be developed only "according to the rules of fortification" ("po regulu fortifikatsii") – in the professional terminology of the Russian military engineers of the 18<sup>th</sup> century this phrase meant following the rules of European military architecture. A further requirement of Shuvalov was that the principles of regularity of the planning had to also be strictly applied to development of layouts for both the main territories of the fortresses and the "vorstadts"<sup>7</sup>.

Shuvalov sought to go over all the details of the process to create defensive lines. Before starting the construction of permanent fortresses according to the "indispensable projects", he ordered the construction of temporary forts based on the "temporary projects" ("vremennyye prozhekty"). This was supposed to ensure, within a short period of time, the security of the builders as well as the garrison. What is more, with the intention of saving resources as much as possible and to schedule a further progress of construction, Shuvalov prescribed the use of the temporary forts when building the permanent fortresses, ordering that this be taken into account during the development of the projects and displayed in graphics. In this way, the erection of the fortresses' defences was supposed to consist of two stages.

In the final part of the *Instruction* Shuvalov ordered the provision of financial statements with the calculations of the finances, builders, materials and stores needed for the construction of temporary and permanent forts. Statements concerning provision with artillery, engineers and garrison also had to be presented. Furthermore, Shuvalov considered the environmental dimension of the emplacement of the fortresses. It was strongly recommended to avoid sites with "unhealthy air" and "stagnant waters" when selecting the construction sites. It was also not allowed to build forts close to mountains, deep gullies and areas prone to flooding.

Moreover, the General Feldzeugmeister gave directions concerning the engineers' planning time. He recommended that after they sent the produced project documentation to St. Petersburg they should not to waste time on waiting for an answer from the capital, and that they should make a detailed map of the lines mapping all the projected fortresses, features of the area and "ancient fortifications" if identified. Shuvalov also tried to consider the scenario of the engineering team failing the mission. He ordered that, if this were to happen, the chief engineering officer must replace the team members with graduates from the Artillery and Engineering Corps and officers from the Siberian province "skilled in the engineering science". Another scenario anticipated by Shuvalov related to the time after the completion of the construction. He was concerned with the maintenance of the future fortresses and proposed that a staff of engineers be established, manned with the grown children of the military personnel inhabiting the fortresses. In the final paragraph of the *Instruction*, Shuvalov allowed the seconded engineers to take their own initiative in some cases but only in accordance with their assigned positions and knowledge.

In spite of giving engineers the possibility to act independently if necessary, the *Instruction* still was, in general, of a regulatory nature. Shuvalov tried to spell out the answers not only for the design of fortresses but also for environmental, personnel and operational issues. As can be seen, Shuvalov sought to give the *Instruction* the role of a comprehensive written guidance for achieving the goal of the mission which, let us recall, was to identify the areas best suited for the construction of fortresses and to develop the projects of these forts. The analysis of Shuvalov's text shows that in this endeavour he used as his basis logic which developed "from the general to the particular". As shown above, the design had to move sequentially from the project of a defensive line to the projects of fortresses – from the "road map" (i.e. the tracing map of lines) to the "true plans" (i.e. the situation plans for every fortress) and only after that to the creation of "temporary" and "indispensable" projects. Such an approach allowed the author of the *Instruction* to concretize step by step his ideas about the implementation of the mission's goal.

However, at a certain point, the prescription and the rigid logic of the progressive refinements has forced Shuvalov to answer the question of what exactly the projects of the fortresses should be. On the one hand, following this logic required the maximum concretization of Shuvalov's ideas about what fortresses he would like to see on the lines. On the other hand, the features of the Nercha and Selenga river valleys, where the lines of the fortresses were supposed to be designed, were totally unknown to Shuvalov – he was in St. Petersburg, thousands of kilometres away from East Siberia. Thus Shuvalov, without any knowledge of the landscape, had to provide the engineering team with directions on how to design the fortresses. He grappled with the contradiction of this situation by using topographical data, which he asked the seconded engineers to be careful to collect. Shuvalov's solution was to maximally summarize all variants of landscape features which he thought the engineers in East Siberia could be faced with, and to propose four kinds of fortresses and their corresponding model projects accordingly. Taking into account the topography, the engineers could choose the most suitable variant of the model projects and adapt it to the particular conditions. Thus, according to Shuvalov, the solution to the identified problem was to deviate to some extent from rigid logic and prescription, in favor of flexibility.

## Four kinds of fortresses

Let us consider four kinds of fortresses and their corresponding model projects proposed by Shuvalov. It should be noted beforehand that the detection of these graphic materials was a special phase of our study. In the collection of the Russian State Archive of Ancient Acts, the text of the *Instruction* (RGADA, coll. 248, series 113, file 1527) is stored separately from the model projects (RGADA, coll. 248,

<sup>8</sup> The original title of this plan in Russian is: "Primernoy plan kreposti kakova polozhena mozhet byt' dlya prikrytiya ot nepriyatel'skikh nabegov, vnutrennikh seleniyev" (RGADA, coll. 248, series 160, file 1892).

series 160, files 1892, 1893, 1894, 1895) without any reference to link these documents together. However, thanks to Shuvalov's indication in the text that the model projects were attached to the *Instruction*, we initiated and successfully completed a search for these images in the collection of the RGADA. The identified model projects (which, like the *Instruction*, date back to 1760 and are signed by Count Shuvalov) were compared with descriptions of the four kinds of fortresses, presented in the text of the *Instruction*. As a result, we obtained the following correspondence:

- the first kind of fortifications correlates to the "small" fortresses,
- the second kind relates to fortresses "near important pathways",
- the third kind correlates to two fortresses – "near a sea gulf" and "near a river",
- the fourth kind is not represented graphically.

As pointed out above, the *first kind* correlates to the "small" fortresses. In the recommendations for selecting sites for fortresses of this kind, it is stated that their only purpose is the protection of the inhabitants living in the surrounding settlements. That is why Shuvalov instructed that they be placed in immediate proximity to these settlements in order to ensure that, in case of danger, the fortress and settlement could help each other with provisions and ammunition. Furthermore, the location of such fortresses was intended to provide control over roads. According to Shuvalov, the forts of the first kind should be "small, namely, quadrilaterals and pentagons". It is interesting that this phrase expressed one of the approaches to the formation of the plans of the forts. This approach was reflected by the fact that a square of the main territory of a fortress is in direct proportion to the number of polygon lines. The plan, corresponding to these requirements (fig. 2)<sup>8</sup>, shows

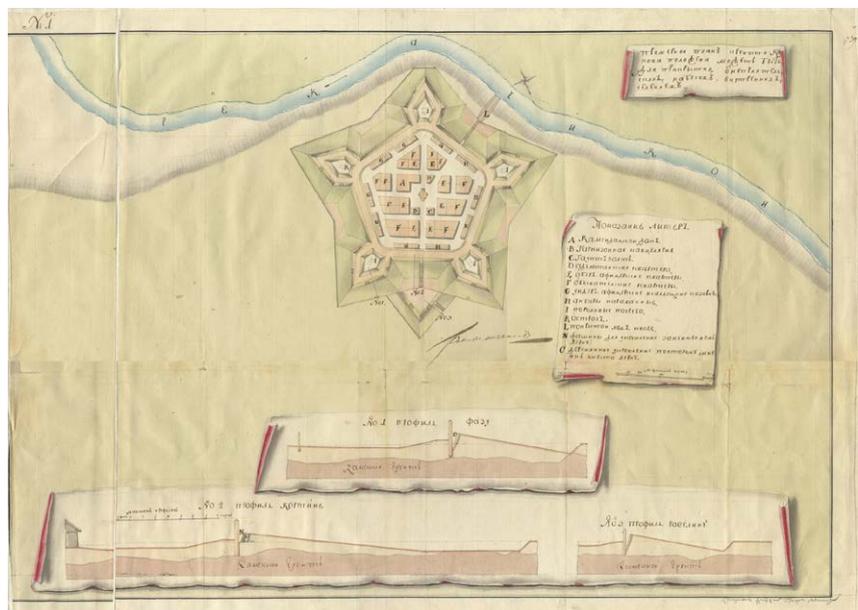


Fig. 2 – The project of the «small» fortress (first kind). Division value for the scale on the plan is 40 sazhen, on the profile is 1 sazhen. 1760. RGADA, coll. 248, series 160, file 1892.

the fortress on the river bank with five bastions and ravelin, but the settlement, which was intended to be under the protection of this fortress, is not presented on this plan<sup>9</sup>.

The *second kind* consists of fortresses “near important pathways”. These forts had to be larger in land area than the fortresses of the first kind and had to have comparatively better fortification. In Shuvalov’s view, fortresses of the second kind were especially necessary in places, where, by the time of their construction, merchants and tradesmen already resided. In the recommendations for selecting sites it was noted that fortresses of this kind were necessary to try to ensure the security not only of the merchants but also of the native inhabitants. Consequently, Shuvalov provided the construction not only of fortresses but also of “vorstadts” for these people. There were two possible obstacles to the building of the fortification works around the “vorstadt”. The first was related to the large size of these suburbs and the significant labour required for their fortification. The second was linked to the different peoples living within the limits of the “vorstadt” and the potential conflicts between them. The plan corresponding to the fortresses of the second kind is given in fig. 3<sup>10</sup>. This image shows the main territory of the fortress where the administrative, residential and economic buildings of the military and church are situated. The “vorstadt”, composed entirely of merchant possessions with a church in the centre, is also shown on this plan.

The fortresses of the *third kind* were intended for location “near operable water communications where commercial and other needs in the time of peace and of war can be sent”. These forts were required to have harbours and wharfs to ensure safety of navigation. In the recommendations for selecting sites it was noted that fortresses of this kind should be located so as to make it impossible for any ships to pass undetected. In addition, the engineers were allowed to complete these fortresses with temporary fortifications to control riverbeds and islands.

The interesting thing is that the text fragment of the *Instruction* about selecting the sites for the construction of forts of the third kind dealt only with rivers. At the same time, there are two projects of this kind attached to the document – the project of the fortress “near a sea gulf” (fig. 4)<sup>11</sup> and the project of the fortress “near a river” (fig. 5)<sup>12</sup>. Thus, the matching of the graphical part with the textual part concludes that within the context of the *Instruction* the phrase “operable water communications” means not only a river but also the sea. All this confirms that the text and the graphics of the *Instruction* need to be considered as a whole, otherwise the understanding of its meaning remains incomplete.

Shuvalov noted that, compared to the other fortresses, the forts of the third kind are the largest in terms of population, however, in their design it is necessary to comply with the recommendations for fortresses of the second kind. Indeed, there are some similarities between the projects of forts of the third and second kinds: the structure of the layouts of the main territories (in comparison with the fortress “near a river”), the location of the civil buildings in the “vorstadt” (in comparison with the fortress “near a sea gulf”), the applying

<sup>9</sup> The model projects (fig. 2-5) are scaled using *sazhen* which is an ancient Russian linear measure equal to 2.13m.

<sup>10</sup> The original title of this plan in Russian is: “Primernoy plan kreposti kakova polozhena byt’ mozhnet pri znatnykh pasakh” (RGADA, coll. 248, series 160, file 1893).

<sup>11</sup> The original title of this plan in Russian is: “Primernoy plan kreposti kakova mozhnet polozhena byt’ pri morskoy zalive gde kormertsiya vodoyu otpravlyayema budet” (RGADA, coll. 248, series 160, file 1894).

<sup>12</sup> The original title of this plan in Russian is: “Primernoy plan kreposti kakova mozhnet polozhena byt’ pri reke, gde komertsiya vodoyu otpravlyayema budet” (RGADA, coll. 248, series 160, file 1895).

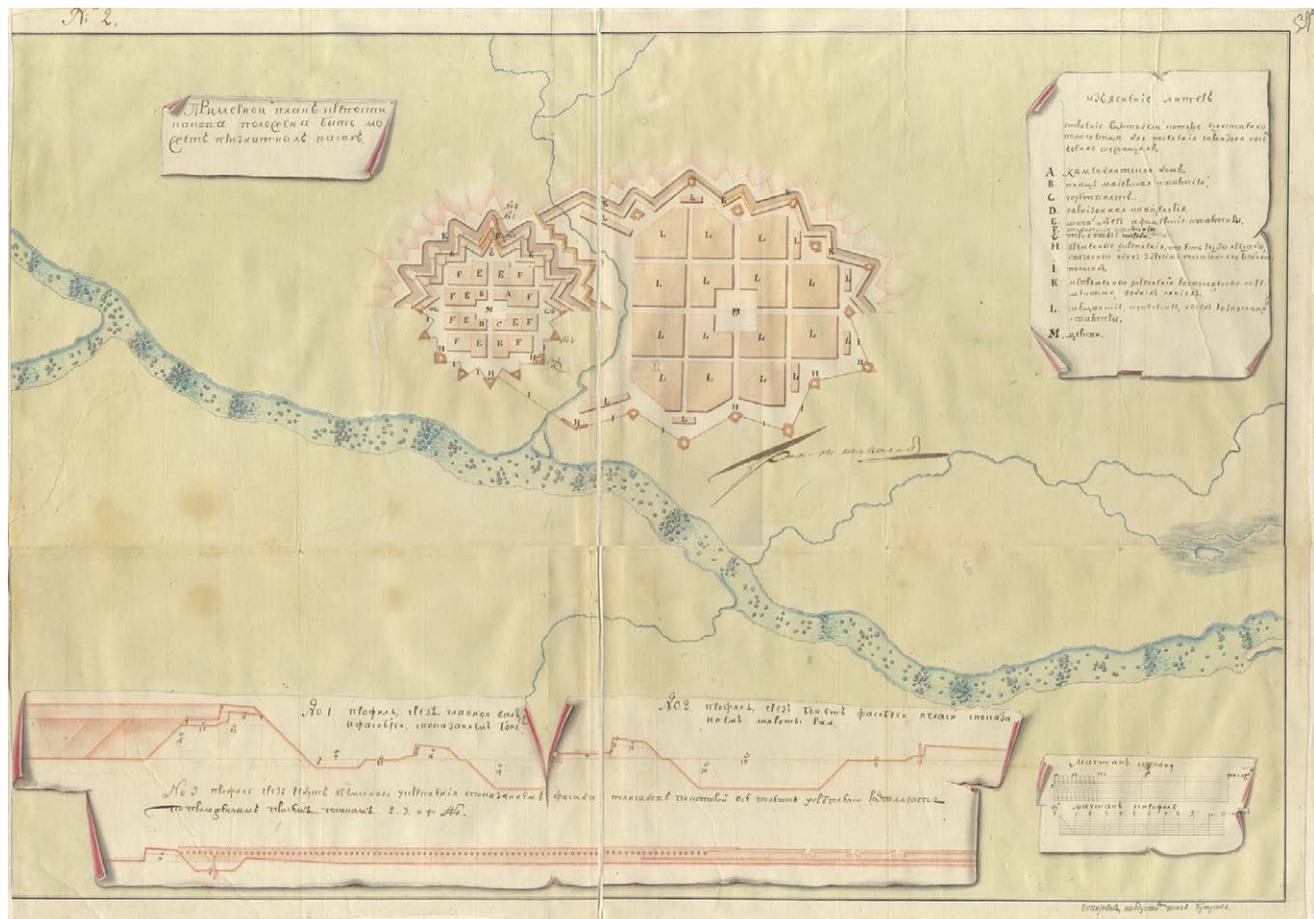


Fig. 3 – The project of the fortress «near important pathways» (second kind). Division value for the scale on the plan is 100 sazhen, on the profile is 1 sazhen. 1760. RGADA, coll. 248, series 160, file 1893.

of temporary fortifications (in the form of redoubts and redans, connected by cheval-de-frises and palisades).

In contrast to forts of the first three kinds, which relate to permanent fortifications, forts of the *fourth kind* are field fortifications – redoubts and redans. According to the text of the *Instruction*, they were supposed to use a temporary connection between large fortresses in the event of a threat by the enemy to capture a large territory. Thus, this is what distinguishes the Nerchinskaya and the Selenginskaya lines from defensive lines in the European part of Russia (for example, from the Tsaritsynskaya or the Ukrainskaya), where the connection between fortresses were permanent (Buseva-Davydova and Godlevskiy 1994, 68; Mikhaylova and Osyatinskiy 1994, 99). It should be noted that plans were not developed for forts of the fourth kind. It is likely that the construction of the typical redoubts and redans were intended in this case.

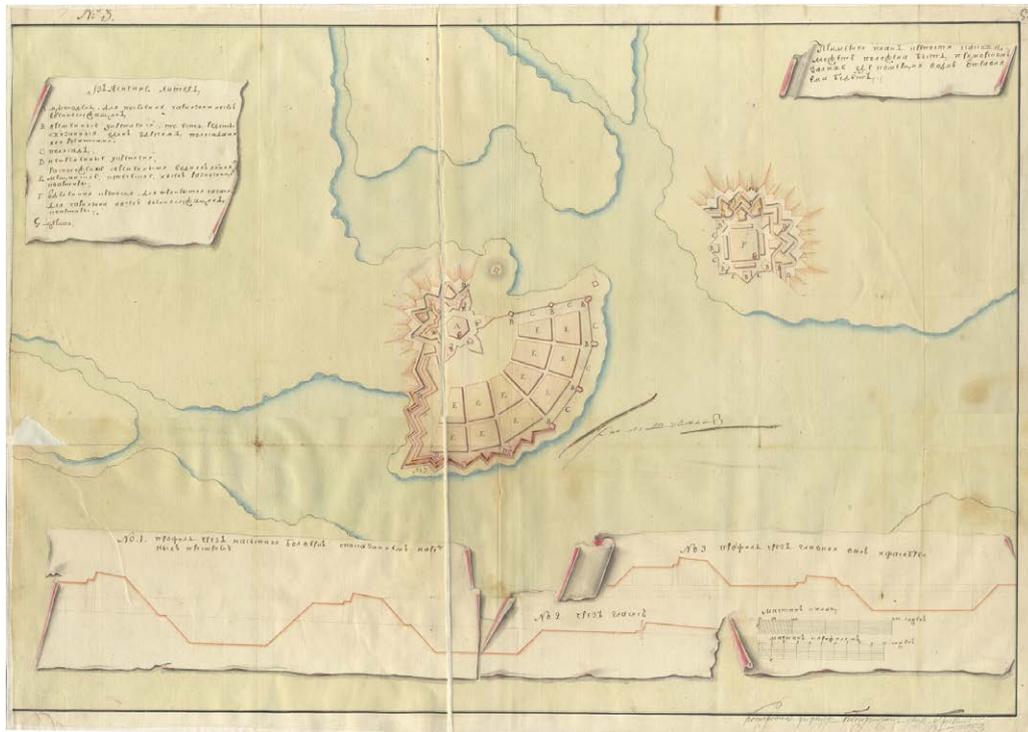


Fig. 4 – The project of the fortress «near a sea gulf» (third kind). Division value for the scale on the plan is 100 sazhen, on the profile is 1 sazhen. 1760. RGADA, coll. 248, series 160, file 1894.

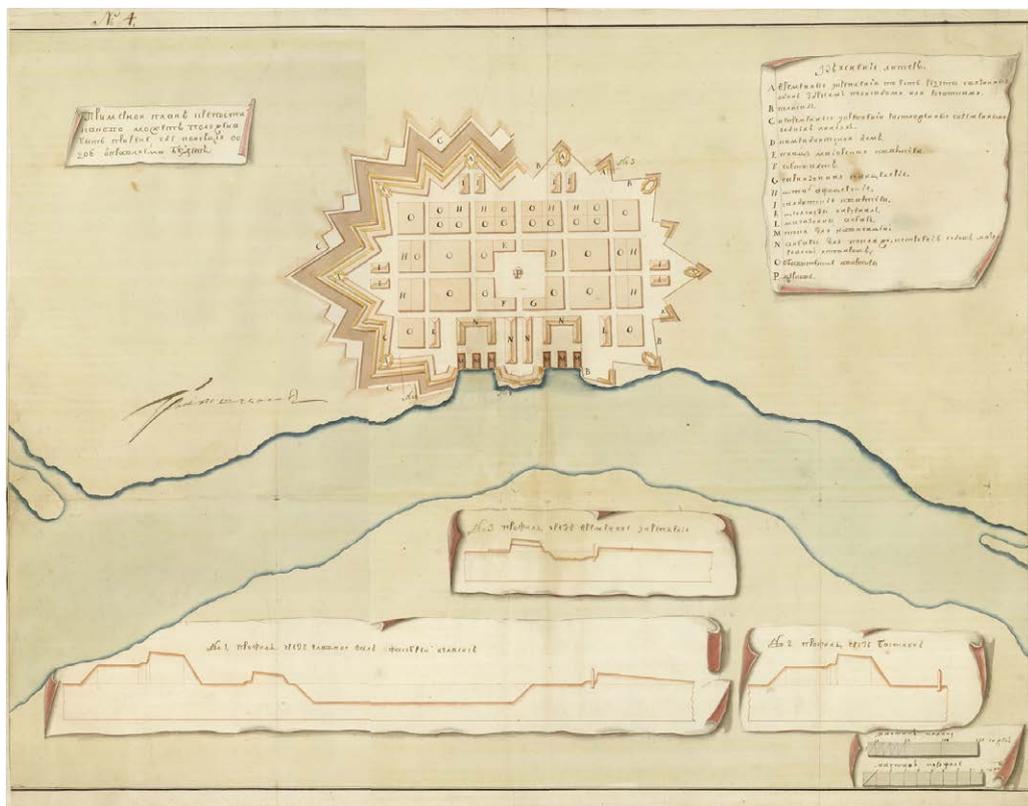


Fig. 5 – The project of the fortress «near a river» (third kind). Division value for the scale on the plan is 50 sazhen, on the profile is 1 sazhen. 1760. RGADA, coll. 248, series 160, file 1895.

<sup>13</sup> In view of the fact that the layout in the project of the fortress “near a sea gulf” has a unique structure, we will examine this project below and separately from the others.

## Fortification and planning features of fortresses

### “Small” fortress, fortress “near important pathways” and fortress “near a river”<sup>13</sup>

#### Fortification features

As prescribed by the *Instruction*, in the discussed projects (except for the “small” fortress – fig. 2) two stages of construction were reflected (fig. 3, 5). As a result, in the graphics and compositions, each of the plans (except for “small” fortress) was divided into two equal parts along the symmetry axis. One of the parts represents the fortress with temporary defensive works, and the other shows the fortress after the completion of the construction of permanent fortifications. It is evident from the projects that the temporary redoubts and redans were to form the basis for the permanent earthen ditches and banks intended for resistance to firearms. The defence systems of the fortresses are based on the application of a tenaille trace (the fortresses “near important pathways” and “near a river”) and bastion trace (the “small” fortress enhanced by a ravelin). Apart from the above application of tenaille traces, the fortresses “near a river” and “near important pathways” share other similarities in their defence systems. They both have bonnets and fausse-braies. Thus, Shuvalov’s requirement for the design of fortresses of the third kind to comply with recommendations for fortresses of the second kind has been met. However, there are some differences. In the fortress “near important pathways” the main bank as well as the fausse-braie have bonnets, whereas in the fortresses “near a river” only the main bank is completed with bonnets.

#### Planning features

The “small” fortress, the fortresses “near important pathways” and “near a river” have strictly regular plans. The layouts of these fortresses are based on symmetrical composition, the centre of which is emphasized by a rectangular-plan square with a church. These squares are shaped by quarters with a similar building set, mainly comprising of residential and at least two administrative edifices (garrison office and guardhouse).

In all three projects, a grid of mutual perpendicular streets is applied. The directions of the streets are determined by polygon lines. The main streets crossing the squares connect the opposing fortification elements and economic or residential buildings with each other.

The quarters consist of residential, administrative and religious edifices. The economic buildings are most diverse in the fortress “near a river”. In this fort, the function of implementing water communication is significantly expressed. The analysis of the location of residential buildings shows that the further from the centre, the lower the military ranks of the servicemen<sup>14</sup> for whom this development was designed.

The fortification elements, and thus the layouts of all fortresses, correspond with the specificities of the landscape – the defence of fortresses is organized with consideration for the nature of the banks of water bodies.

<sup>14</sup> Military ranks comply with the “Table of Ranks”, which is a piece of legislation adopted in the Russian Empire for procedures regulating State service (Zin’ko 2016).

## Fortress “near a sea gulf”

Let’s examine now the project of the fortress “near a sea gulf” (fig. 4). In fact, this is a complex of two independent forts. The first is the “citadel for the living of garrison and all servicemen”, the second a “separate small fortress for protection of the gulf”. Furthermore, this complex includes two redoubts, which additionally strengthened the gulf from the side of the “separate small fortress”. Among all the fortresses examined, the fortress “near a sea gulf” has the closest connection to the landscape, which was maximally used to create the most efficient defence possible.

The plan of the “citadel” (of the main fortress of the complex) is strictly regular and represents a perfect hexagon. The defence system is based on a bastion trace, and, as in the fortresses discussed above, is formed by the use of temporary defensive works. This fortress is strengthened by three ravelins. For the inner territory, only the general plan of building development in the shape of hexagon is shown. Its side is equal to 40 *sazhens*. The church is situated near one of the corners of the hexagon, distinguishing the composition of this fort from the centric compositions of other fortresses.

It should be noted that in the examined series of projects, the “citadel” “near a sea gulf”, as well as the fortress “near important pathways” includes the “vorstadt”. The “vorstadt”, being a part of the centripetal composition, is subordinate to the centre of the “citadel”. The quarters in the “vorstadt”, separated with radial streets and with one circular street, include “the apartments of merchants and of people of miscellaneous ranks”. The quarters, taken together, form a sector (almost quadrant). This is dictated by the contours of the coast of the peninsula. Unlike the fortress “near important pathways”, there is no square in the “vorstadt” of the “citadel” “near a sea gulf”.

The plan of the “separate small fortress” is formed by the combination of two squares, turned relative to each other at 45 degrees. The defence system includes eight “bollwerks” and outworks. As in the inner territory of the “citadel”, in the “separate small fortress” only the general plan of building development in the shape of square is presented. Its side is equal to 80 *sazhens*. Rectangular elongated quarters are adjoined to each side of the square. The church is shown in the corner of the square.

Thus, the analysis of fortification and planning features of fortresses revealed that the requirement expressed by Shuvalov in the text of the *Instruction* concerning

the development of projects only “according to the rules of fortification” (“po regulu fortifikatsii”), i.e. in compliance with the rules of European military architecture, was fully reflected in the model projects. The defence systems of fortresses are based on the application of tenaille and bastion traces. At the same time, the layouts in the model projects were in accordance with another one of Shuvalov’s important requirements – concerning the regularity of the planning. This was expressed in the geometrism and ordering of both inner territories and suburbs (“vorstadts”). Moreover, the layouts of most of the fortresses are based on a centric symmetrical composition.

## Conclusion

The research findings presented above show that, on the one hand, the 1760 *Instruction* on designing fortresses on defensive lines in East Siberia was distinctly prescriptive. Shuvalov’s remoteness from the construction sites made it necessary for him to provide the seconded engineers with guidelines on dealing with the wide variety of difficulties that they could have encountered in the course of their work in East Siberia. In the *Instruction*, Shuvalov sought to prepare answers in advance to environmental, staffing and operational questions as well as to questions about the design of the fortresses. Shuvalov’s directives regulated the design process in full – from the project of a line as a system, to the project of a fortress as its element. In doing so, Shuvalov followed rigid logic “from the general to the particular”. His prescription was also expressed in the scheduling of the stages of construction and maintaining continuity in the creation of the “temporary” and “indispensable” projects for the temporary and permanent fortresses. In the transition to the design of the fortresses, the engineers had to use as their basis the model projects attached to the *Instruction* which corresponded to the four kinds of fortresses. These model projects were developed taking into account the possible landscape diversity and were supposed to be the key to addressing the challenge of the construction of the fortresses in East Siberia, thousands of kilometres away from the capital of the Russian Empire. At that, in the design of fortresses the seconded engineers were required to strictly abide by the rules of European fortification and the principles of regularity of planning. The latter was entirely consistent with the principles of rationalism, inherent in 18<sup>th</sup> century Russian urban planning.

On the other hand, in the *Instruction* there is some deviation from rigid logic in favour of flexibility. It was this focus that allowed Shuvalov, without any knowledge of the landscape, to solve the problem of providing seconded engineers with prescriptions on how to design fortresses and propose four kinds of fortresses and their corresponding model projects. The aspiration to ensure a peaceful life for the local civilians under the protection of the arriving Russian military, as well as the desire to prevent conflicts between native peoples, required Shuvalov to allow for

variability in the project solutions developed by the seconded engineers, based on the model projects. He ordered the engineers not to apply the model projects literally, but in light of the presence (or absence) of spaces already converted by local civilians. Depending on the nature of relations within national and class communities of local civilians he recommended either to include these territories into the system of "fortresses – vorstadt" or to avoid such solutions. Hence, the centred compositions with regular street grids of the bastion and tenaille fortresses, presented in the model projects attached to the *Instruction*, could be complemented and modified with new spaces.

Thus, challenges to the construction of fortifications on the Nerchinskaya and the Selenginskaya defensive lines in East Siberia and in subsequent urban development of neighboring territories required Shuvalov to balance prescription with flexibility. In conclusion, it should be noted that so far, it has not been established whether Count P. Shuvalov's 1760 *Instruction* on the creation the Nerchinskaya and the Selenginskaya defensive lines has been implemented. No fixation plans (of fortresses as well as of lines as a whole) specifically reflecting the *Instruction* implementation have been revealed. Moreover, it is widely believed that defensive lines and "European type" fortresses had never been built in East Siberia. It is often considered that in the Siberian region no lines have ever existed other than those constructed in Western Siberia: Irtyshskaya, Gorkaya and Kolyvano-Kuznetskaya (Okladnikov 1968, 181-197; Buseva-Davydova and Krashennnikova 1995, 277-286). By contrast, in some papers it is stated that in East Siberia, in the 18th century, a few fortresses had been built using the ideas of European fortification (Konstantinova 2000, 156-159; Proskuryakova 1976, 57-58, 63-71; Slovtsov [1844] 2012, 473-474; Tsaryov et al. 2011, 200-210). However, the link between their construction and the Shuvalov's *Instruction* was not established. This, in our view, confirms that the creation of linear fortifications in East Siberia is still an open and controversial issue in the history of the Siberian military urbanism of the 18<sup>th</sup> century. This matter requires further study. ●

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