TRANSFORMATIONS OF RIGA'S FORTIFICATION SYSTEM IN THE 17TH CENTURY AS A LOCAL MANIFESTATION OF WELL-ORDERED FORTRESS

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Resumo: Na segunda metade do século 17 a arquitetura de Riga experimentou transformações substanciais. Riga tornou-se uma das fortalezas mais importantes do imperio Sueco o que marcou uma linha divisória para o início da modernização das fortificações de Riga ao longo do século. Dois períodos de crescimento são evidentes – na década de 1650 e 1680-1690. O primeiro período foi a síntese do antigo sistema holandés; em 1680-1690 o sistema de defesa sintetizado francês foi implementado em Riga pelo Erik Dahlbergh; seus projetos da parte frontal dos bastiões foi uma das principais invenções.
Uma paisagem arquitetónica da cidade dos tempos de barroco começa com o cinto de fortificações. O contexto internacional do fenómeno, uma vez introduzido no ambiente local, cria a paisagem arquitetónica particular da cidade e torna possível falar sobre o "o espírito do lugar".

Palavras-chave: Fortificações; Fortaleza; Barroco; Planeamento Urbano.

Abstract: In the 2nd half of the 17th century the architecture of Riga experienced substantial transformations. Riga became one of the most important fortresses of the Swedish empire and this marked a borderline for the modernization of Riga's fortifications throughout the century. Two periods of rise are evident – in the 1650s and 1680s–1690s. The first period synthesized Old Dutch system; in 1680s–1690s the synthesised French defence system was implemented in Riga by Erik Dahlbergh; his projects of the front of bastions was a major invention.
An architectural landscape of baroque–time city starts with the belt of fortifications. The international context of the phenomena, introduced into the local milieu, creates the particular architectural landscape of the city and makes possible to talk about the "spirit of place".

Keywords: Fortifications; Fortress, Baroque; Urban Planning.

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The 17th century is an essentially important period in Riga's history of architecture, indicating dynamic changes in both fortification building practice and urban planning. What fostered the development and stabilization of those individual features of Riga's urban image during the Baroque period and later on? The specific architectural landscape of baroque-time city starts first and foremost, with a monumental framework of fortifications that embraces a whole urban body, and updating Riga's fortifications created preconditions for a number of major moves in city plan, endowing Riga with the traits of a Baroque town-fortress.

In the course of the 17th century, the idea about fortification amendments was among the topical questions in the European architecture. In 1621, after the series of conflicts between the Polish–Lithuanian Commonwealth and the Swedish Empire, Swedish forces under the leadership of Gustav II Adolph succeeded in taking the city of Riga after a siege. Riga became one of the most important fortresses of the empire. This marked a borderline for the commencement of wide-scale modernization and radical transformations of Riga's fortifications throughout the century. The visual information that exemplifies the development of Riga's defense system in the 17th century is being represented mainly by the cartographic collections of maps, plans and drawings in archives of Riga, Swedish Military Archives and the National Archives in Stockholm. Views and panoramas created by eyewitnesses is an important source, studying the specificity of Riga's fortifications and architecture. (Fig. 1).

Two main ascending periods of the amendments of Riga's defensive works can be noted during the 17th century: 1) 1630s to '50s when the reconstruction projects were developed according to the Old Dutch fortification system; 2) introduction of a compound system where French and Dutch inventions were combined. This innovation manifested itself progressively in the 1670s and 80s, while the peak of its implementation may be related to the 1690s.

The first reconstruction period deals with introduction of so-called Old Dutch fortification principles. Initial ideas about reconstruction of Riga's fortress dates

Fig. 1. Carl Magnus Stuart. Bird's-eye view of Riga and its suburbs. Fragment. About 1700. *Swedish Military Archives (Krigsarkivet): SFP, Riga Nr. 26.*

Fig. 2.

2a – Heinrich Thome. Plan of Riga's fortification improvement. 1633. Version B. *Swedish National Archives (Riksarkivet): Oxenstiernska saml., Nr. 17, bl. 1–2 (kartavd., m. form.)*

2b – Matthaus Merian. Bird's-eye view of Riga. About 1637. The Museum of the History of Riga and Navigation [RVKM, inv. No. VRVM 32256.]

back to 1621: the envisaged improvements are outlined in a map made for spying purposes by the military engineer Georg Günther Kröll and showing the siege of Riga in 1621. Subsequently, since 1632, extensive works were launched under the supervision of military engineer Heinrich Thomé. His novel plan according to the Old Dutch conception envisaged complicated system of earth ramparts, bastions and ravelins, water ditches and other outworks (Fig. 2a). Matthäus Merian captured reconstruction results of this period in his perspectival view about 1637, featuring Riga as a fortified ideal city (Fig. 2b).

The spread of the Old Dutch fortification system throughout Europe was fostered by an influential centre of learning where military engineers and architects from different countries could perfect their qualifications – the University of Leiden and

Fig. 3. Johann van Rodenburgh. Construction project for Riga's suburbs. 1650–1652. *The Museum of the History of Riga and Navigation*. [RVKM, inv. No. VRVM 161851.]

the course of lectures dealing with the so-called *Duytsche Mathematique* ("Dutch mathematics") taught by a renowned theoretician – professor Nicolaus Goldmann. Goldmann's work *La nouvelle fortification* (Leiden, 1645) also had an important role in the popularization of fortified ideal city, significantly influencing the 17th century Dutch architects, military engineers and urban planners as well as those from other countries, including Northern Germany, Scandinavia and the Eastern Baltic region[1].

From 1625 on, all new plans practiced in the Swedish empire as a rule, became right-angular gridiron plans – from small and simple plans to the most complex and grandiose[2]. But, "austerity and restraint of character does not necessary mean poor, lacking in knowledge of international models and without artistic ability"[3]. In 1650, Franciscus Murrer worked out the upgraded defense project for Riga, to protect the city and its suburbs with bastions. The same year an experienced military engineer, colonel Johann van Rodenburgh experimented in his drafts with the configuration of planned fortifications, modelling the shape of defensive line and shifting ingeniously the spatial masses, encompassed by the bastion front. The final version was the most ambitious one – it was an innovative project for Riga's suburbs and defense line with thirteen bastions and a water ditch (Fig. 3). The project was based on a regular gridiron plan and envisaged the amplification and regularization of Riga's suburbs on a broad scale. Like a number of Dutch town-planning influence zone cities of the time, the Riga plan allocated a significant role to the introduction of a

[1] MARTENS & OTTENHEYM, 2013: 372.
[2] AHLBERG, 2007: 6.
[3] AHLBERG, 2007: 6.

water channel system to the regularized suburbs. Two straight channels, running out of the river Daugava, marked the lines of warehouse quarters.

The grandiose bastioned defense line encircled not only the newly-designed regularly divided suburbs, but included also Riga fortress as a kernel of overall structure, equipped with an inner line of defense – a series of bastions and wet moats. The plan by Rodenburgh distinctly represents how the main principles of the Old Dutch fortification system was introduced into more distant regions of Northern Europe and Eastern Baltics. Prior to their activities in Riga, i.e. in 1640s, both Rodenburgh and his assistant Johann Werenskjöld visited Holland and, supposedly, attended Goldmann's lectures of fortification art at the Leyden University[4].

The construction works of new fortifications in Riga were interrupted by force of economic and political circumstances, caused by siege of Riga by Tsar Aleksey Mikhailovich's troops in 1656. Rodenburgh's proposal was reduced to the restoration of wooden palisades and a regular planning for suburbs.

Rodenburgh's plan was related to the ideas of ideal city topical throughout Europe, as early as real or utopian plans of knitting together the old and new street network abounded (examples – Haarlem, Groningen, Utrecht, Gothenburg, Vänersborg, etc.). The plan adhered to the principle of orienting the street network along east-west and north-south directions, subjecting the included territory to strict geometrisation. The intent of integrating the city's older part with its irregular medieval street network into a common structure with the surrounding territory reveals the author's vision of how to implement the concept of ideal city and ideal fortress in an already existing environment. This example shows how urbanism of the baroque time, by the way of fortification planning, demonstrated its esthetical concept of spatial coherence, interpreting a city as an overwhelming composition.

The 2nd Reconstruction Period of Riga defense system encompasses the time period from 1670s to late 1690s. The planning and construction works of Riga fortress went on under the guidance of the General Governor of Livland Erik Jonsson Dahlbergh – one of the leading military engineers and town planners in Europe of that time. Dahlberg's plan was oriented first and foremost towards the modernization of the defence system of the city, logical co–ordination of broad spatial masses, with an emphasis on a large-scale mode of thinking. With regard to fortress design, the military genius of Dahlberg manifested itself by the introduction of his own synthesised French-Dutch system, instead of quoting his predecessors. Thus Dahlberg, broke away from Sweden's slavish dependence on the Netherlands style"[5]. Undoubtedly, Sebastien Le Prestre de Vauban – the most significant figure

[4] EIMER, 1961: 224.
[5] DUFFY, 1985: 126.

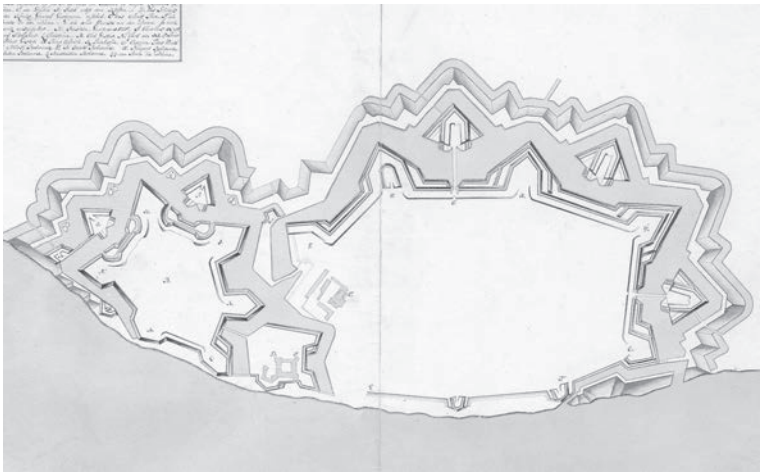

Fig. 4. Erik Dahlbergh. Riga's fortification plan with the Citadel. The 1680s. *Swedish Military Archives (Krigsarkivet): SFP, Riga Nr. 31b.*

in the 17th century military architecture – stands out as Dahlberg's main source of inspiration. Equally with Vauban, Dahlberg invented every fortress individually, adapting to local conditions. A distinctive feature of Dahlberg's fortresses inherent to Riga as well, was sturdy fortifications with particularly big bastions and series of ravelins and outworks (Fig. 4)[6]. Almost everywhere we see evidence of Dahlberg's fondness for particularly massive, projecting bastions, ample casemates and series of defense ditches with ravelins and other auxiliary structures. These obstacles were placed as a screening role in front of the bastioned trace, as extra „layers of the onion"[7] – one of Vauban's basic principles for the creation of „depth defence". Simultaneously, Dahlberg's inventive mind allowed him to merge the typological traits of different defense systems: not only French, but also New Dutch fortification principles, used by Vauban's rival – Dutch military engineer Menno van Coehoorn. Although in the mid-17th century six bastions were already built around the city of Riga, they underwent substantial modernization under Dalbergh's guidance. Four ravelins were also added until the end of the century. To enhance the defensive capacity of each bastion, they were double-flanked. Innovation of the French system introduced casemates and gunpowder storages in bastion faces – therefore Dahlbergh's bastions had short flanks and several levels.

To protect Riga from north, in 1650 the construction of Citadel was also initiated. In line with Dahlbergh's concept, after 1670 the Citadel was separated from the Riga Castle as a detached fortress (Fig. 5), enlarging its territory and moving it farther northwards. Obviously, the project of the Citadel was inspired by the idea

[6] AHLBERG, 2007: 9.

[7] GRIFFITH, 2006: 44.

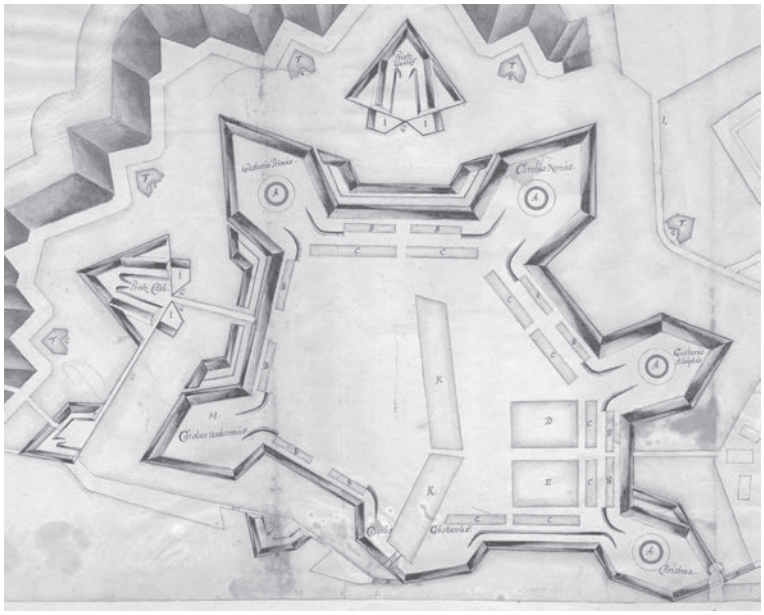

Fig. 5.
Erik Dahlbergh. Riga Citadel layout with bastion towers (A). The 1680s. *Swedish Military Archives (Krigsarkivet): SFP, Riga Nr. 24.*

about a fortress of star-like configuration that spread throughout Europe since 15th century, owing to theoretical works by Italian architects Baldassare Peruzzi, Pietro Cataneo, Vincenzo Scamozzi, as well as German theoreticians Daniel Speckle, Johann Melchior von Schwalbach and others. Ideal city plans illustrated various theoretical works on the ideal form and function of fortified towns. A rather early sample – Fort Bourtange – was created in the Netherlands, a later version – in Naarden. In late 17th century several replicas of Palmanova were created in the North – like Fredrikshamn in Sweden and the Citadel of Copenhagen. The most significant specimen of this kind was Vauban's created Neuf-Brisach in France, which Dahlbergh had to know quite well. Unlike the city fortifications, that were created taking into consideration to greater extent the pre-existent medieval town structure, the specific strategic location and function of Riga Citadel allowed to envisage a compact, star-shaped fortress with six bastions, a wide water-filled ditch and two ravelins. As one can observe from a plan of Citadel, characteristic round towers were designed on each bastion, in this way providing the best possible defence of the fortress. They were more expensive to build, yet the idea of bastioned towers was to prolong resistance for longer than was possible for a normal bastion. It was supposed to act as a heavily armed and self-sufficient citadel in its own right[8]. The

[8] GRIFFITH, 2006: 44.

Fig. 6.
Excavations at the Marstall bastion. Outer wall of the bastion flank with dolomite cladding. Excavation site in November 2015.

rounded, multi-level bastion towers were the surest signs of Dahlberg's presence. Samples of this kind existed also in Wismar, Malmö, Göteborg etc.[9].

Dahlberg also implemented into practice the idea of construction of bastions at the riverside. His plan from 1680s shows three triangular projections directed towards the river Daugava. Two of these are the only in part remaining original bastions preserved in Riga that provide us with authentic information regarding the Dahlbergh-time construction principles. In late 17th century the art of fortification building reached the climax of complexity and invention: they were fabricated out of softish stone bedded on deep masses of earth. Outer walls of bastions, ravelins and ramparts were covered with masonry; there were generally varieties of dolomite stone used as building materials. The Bishop's bastion or so-called, Triangel" has been uncovered in 1999, its fragment is conserved and visible nowadays. The excavations uncovered entire wall moulding of the bastion, in a relatively good state of conservation. It was a pentagon in plan, with edges of slightly different length (~22-28 m)[10]. The breadth of the bastion by the curtain was 61 m. The outer wall, whose thickness reached 2,2 m, was built of rough grey dolomite stones. The cladding contained a mixture of irregular stone pieces and bricks, joined by a cohesive substance, but the external surface was coated by rosy or grey cut dolomite blocks. Its sloping wall was supported by 12 square buttresses from inside the bastion.

[9] DUFFY, 1985: 196.
[10] LŪSĒNS, 2000: 3.

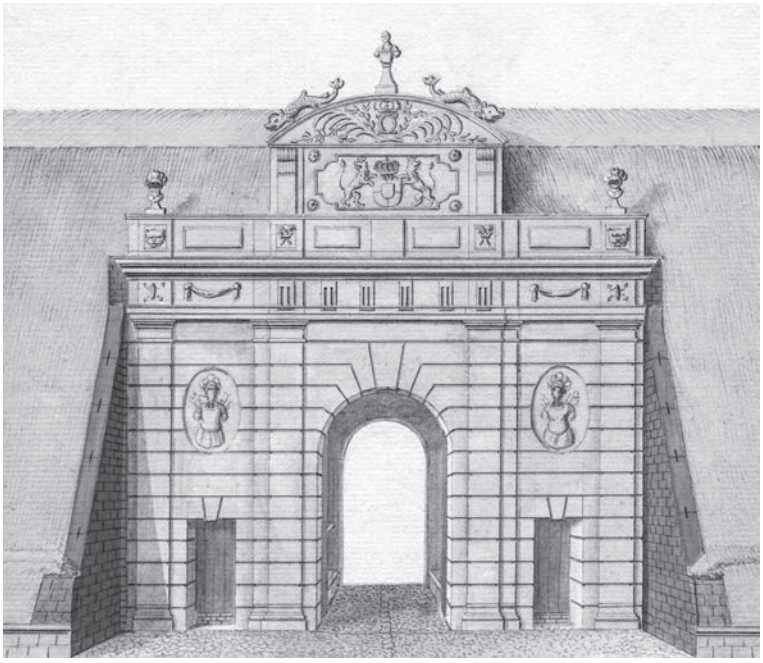

Fig. 7. King's Gate in the Citadel of Riga. About 1670. Designed by Erik Dahlbergh, realised by the master builder Niklas Bollart and sculptor Christoph Mittelhausen. Drawing by Johann Christoph Brotze. 1791. *The Academic Library of the University of Latvia, Rare books and manuscripts collection. [LUAB RRGN, coll. No. bm04180a.]*

Recent archaeological excavations, carried out in November, 2015, have revealed remains of Marstall bastion (Fig. 6) – the most extensive one among the riverside defensive constructions, whose major part still lies intact under the street level. The thickess of the bastion wall reached more than 3 m, the outer cladding with a height of 2,2 m consisted of 5 layers of smooth well preserved dolomite blocks. The excavations uncovered the principal junction between the curtain wall and the flank of the bastion that made an angle of 120 degrees, which corresponds with the construction principles of Vauban-time French fortress-design.

The vital and extrovert style which is typical to absolutism epoch, represented itself by the trend to a new monumentality. A Baroque fortress, that is basically a functional product of war engineery, included the representative function as well and required iconological program to glorify absolutism. The ideological accent was the fortification gate that compositionally envisaged praises of the monarch. About 1670 the entrance to the Citadel – King's Gate (Fig. 7) was created after a design by Erik Dahlbergh. It had a triumph arch composition complemented with an attic floor, niches, aediculae, sculptural décor and heraldic reliefs. The gate was architectonically similar to Dahlbergh's King's Gate in Gothenburg and Narva in 1691. Construction works were entrusted to the Dutch master builder Niklas Bollart; the sculptor Christoph Mittelhausen employed by the King of Sweden possibly executed the sculptural finish.

The impressive Karl's Gate (1685–1687, supposedly after a design by Dahlbergh) was located at the Eastern wall of the Riga fortress, with exit towards St. John's Suburb. The gate had a triumph arch composition complemented with an attic floor, niches, aediculae, reliefs with heraldic motifs, trophies and the sculptural portrait of the King crowning the whole composition. It was decorated with a classical gable, and sculptures of Mars and Pallas Athena flanking the gate portal, as well as two allegorical figures on the pediment slopes. The iconographic subtext implied the provident conquest policy of the Swedish monarch, by grounding the implementation of his military goals on inseparable unity of boldness, power and wisdom.

Detailed regulations of fortification gate finish were worked out, depending on the place the concrete gate occupied in the hierarchy of the whole fortification ensemble. Either Doric or Tuscan order was used in all fortification gates. In particular projects for Riga, Dahlbergh was sometimes quite close to Vauban's conception, possibly creating free copies inspired by French examples. If Vauban's fortification gate concept usually envisaged a monumental, uniform portal solution with programmatic reliefs concentrated in some places (largely in the tympanum of the pediment), Riga's examples stood out by the wish for sculptural décor and emphasis on details. Dahlbergh also used solutions of Dutch architects based on classical architecture. In his treatise *Vollständige Anweisung zu der Civil-Baukunst* Nicolaus Goldmann offered such an easily adaptable models of a monumental gate.

In the 2nd half of the 17th century the fortress of huge dimensions, with its sophisticated profiles, series of outworks and monumental sharp bastions, became an important element dominating the silhouette of the baroque city of Riga. In line with Dahlbergh's concept, changes within the street network were also introduced: several streets of the Old Town were straightened up to the ramparts, and this way the central axis of the Old Town was emphasized, to consequently move accents towards more symmetrical organization of the city plan. A novel phenomenon of the time was the extension of the city in the territory between ramparts – a free space between medieval and modern defensive lines. The bird's-eye view of Riga and its suburbs by Carl Magnus Stuart from about 1700, featured most precise image of the city and its fortifications in the last quarter of the 17th century. Although the Riga fortress in its original shape has not preserved till today, the inventions of Baroque time have influenced the further development and outline of Riga's historical centre. In 1863, according to a novel development plan of the city, the walls and ramparts of the fortress were destroyed. The Citadel area was merged with the core of the historical centre, while the former zone of glacis has been allocated for a park. The defensive moat, being incorporated into the park landscape, still surrounds the Old Town tracing the configuration of the former baroque-time fortress. The grand fortification building program, implemented in

Riga, was substantial to the town structure of that time not only from a defensive point of view – it should be regarded as an organizational dominant of the urban space, that accordingly contains particular aesthetic values of the baroque time. The campaign of Riga's fortification building throughout in the 17th century demonstrates the overall influence of warfare processes and developments of military architecture dominating the Early Modern Europe and the integration of these principles into the local milieu.

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