Rotunda church in Russia as typological phenomenon

O B Tereshina
Department of Design and Fine Arts, South Ural State University, 76, Lenin Ave.
Chelyabinsk 454080, Russia
E-mail: tereshinaob@susu.ru

Abstract. The article describes results of a complex research, in the course of which the main stages of origination and formation of a rotunda church as a rare type in the history of the world’s and Russian architecture have been determined. The main groups of rotunda churches in the world architecture (7 types) and Russian architecture (9 types) have been identified together with criteria of their classification and typological characteristics, the chronology frames of formation of certain types. Space-planning and compositional decisions in designs of rotunda churches have been analyzed based on their types in the context of typology developed by the author. The types of rotunda churches and individual monuments of rotunda church architecture from the world architecture history, which served as a source of inspiration for architects in Russia, are considered. Features of Russian rotunda churches connected with the Orthodox traditions and national traditions of church architecture were identified. The examples of rotunda churches around the world, constructed within the multi-age period between the 6th century BC till the 19th century, and of Russian rotunda churches constructed within a short period from the end of the 17th century and till the middle of the 19th century, are made.

1. Introduction
From the ancient times, the history of the world architecture has been showing the eternal aspiration of people to reach some ‘perfection’ when constructing buildings, and create a harmoniously integral volumetric and spatial composition. The most understandable and natural method for a person to create a ‘perfect’ building is to use the symmetric composition and its particular case – the axial and central symmetry. Layout of such a building has a form of a regular polygon or a circle, and its vertical axis passes through the apex of the flooring and the center of the layout. When completed with a pavilion, a cloistered vault or a dome, a building integral in its perfect harmony gets constructed, its inner space symbolizing the idea of interconnection of a person with the universe. Without a doubt, the aspiration to a perfect composition is the most explicitly represented in church architecture, which was the most important type of architectural art up to the end of the 19th century. Axial-and-central (centric) composition has been historically used when constructing churches and mausoleums, and a perfect sample of solution of the corresponding architectural problem is a rotunda covered with a semi-spherical dome. Rotunda church as an architectural type excites undeniable interest from both ideological-compositional and constructional points of view. Moreover, buildings which have a round layout are very rare for the art of architecture around the world. For Russia, rotunda church is a special, non-traditional type of church architecture. In order to determine the main groups of rotunda churches as well as their typological characteristics in both the world’s and Russian architecture, a complex research was carried out. Chronological frameworks of the research were from the primitive-
communal period till the end of the 19th century. Several objectives were set within the research. It was necessary to identify rotunda churches around the world and at the territory of Russia, carry out a typological analysis targeted at determination of space-planning and compositional specificities of such churches. Narrowing the range of the main and the most efficient criteria of classification was quite a complex task. Considering the goal of compiling the classification and forecasting the main results of the research work, the classification of rotunda churches was based upon layouts of buildings. Constant typological features were determined based on the presence and compositional connection of the main space-planning elements of a building.

2. Typology of rotunda churches in the world architecture

Having traced the stages of development of rotunda shapes in the world architecture, it can be noted that the history of development of rotunda shapes originated in the primitive-communal period. [1-11] Round dwelling places and burial structures of different nations, which had been developing during many centuries, can be considered as ‘pre-rotundas’. Formations of rotunda churches as an integral architectural type with certain space-planning and compositional decisions started in the Ancient Greece. Within the period from the 6th century BC till the end of the 18th century, there were seven general types of rotunda churches that had established in the world architecture: tholos, frontal-axial, multifoil, ‘clear’, basilican, cross-shaped and ‘concealed’ rotundas. It should be noted that the authors didn’t set the goal to identify all rotunda churches that have been constructed over the history of mankind. There is also some relativity in classification of the identified scope of architectural art of building rotunda churches. Let us consider each determined type of rotunda churches.

Ancient Greek tholos was the firstly formed type of a rotunda church. According to classification of churches by Vitruvius [4], there are two specified types of round buildings together with the prevailing rectangular ones: a monopteros consisting of a colonnade and a roof, and tholos with a cella surrounded by a colonnade. As a rule, rotunda churches in the Ancient Greece were constructed in the form of a tholos rested on a three-stage stereobate, and had a layout of a perfectly round shape. Conic roofing had a decorative purpose; a certain orb or various orbs were used in architectural appearance of the building: Doric and Ionic orbs were used for exterior, and Corinthian orb was used for inner decoration. The ancient tholos in the Temple of Apollo in Delphi is the earliest one (around 580 BC).

Frontal-axial rotunda is represented by the most numerous group of buildings. This type of rotunda churches originated in the Ancient Rome and had become popular later in the Renaissance era and the Baroque era. One of the essential elements in formation of such a type of church is a temple in the complex on Largo Argentina in Rome (the 2nd century BC). This building is a tholos on a round podium with a staircase only in front of the entrance; this ladder creates a strictly axial orientation of the temple. A special spot in Roman and world architecture belongs to Pantheon, the ‘temple to all the gods’ that had been reconstructed on the Field of Mars in Rome in 118–128. All historians of architecture unambiguously identify Pantheon as the greatest masterpiece and the symbol of the broadest creative abilities of a man, the ultimate level of expression of engineering and architectural thought of the Ancient Rome. Having reflected new tendencies in development of religious ideology, the Pantheon, which represents the most monumental sample of a dome building of the Rome era, had become one of the prototypes of a number of Christian centric churches of the Byzantine era. It should be noted that the main contribution made by the Ancient Rome in formation of rotunda churches was invention of a dome-shaped roofing.

The type of ‘clear’ rotunda is represented by a small group of buildings. It originated together with development of Christian ideas and transformation of Roman tombs – mausoleums – into a new type of buildings, the Christian churches. In that period, the type of a dome rotunda with an illumination dome drum resting on the inner colonnade started to be developed. The most remarkable example of such a type of buildings is the Mausoleum of Constance on the Nomentana road in Rome, which has become the Church of Saint Constance. Some buildings of baptisteries can also be related to the type of a ‘clear’ rotunda. For example, the baptistery in Pisa (1153) which had bound the Middle-age Italy and Ancient Rome with the threads of succession, and anticipated the Renaissance. A small
chapel in the yard of the San Pietro in Montorio Monastery in Rome, as known as Tempietto del Bramante (1502), is an inimitable in its perfection ‘clear’ rotunda. During many centuries, the composition of this chapel varied in numerous rotundas of the Classicism and Empire styles.

In the middle age, an original typological group of rotunda churches, the majority of which have been constructed in Armenia, formed in the Eastern Europe and Transcaucasia. They were centric multifoil churches with a dome hall and an external conic or umbrella top. These rotundas are characterized by national originality and its own interpretation of a round building’s composition. Characteristic feature of centric dome churches of this type are the verticality of composition, laconism and rigor of the architectural image with the prevailing mass of decoratively faced wall. Dome space, which is round in its layout, was surrounded by six to eight apses. In the majority of cases, exterior of a building was in the form of polygons, the upper one of which was a dome drum.

In Western Europe of the Middle age, the type of a Christian basilica church with a layout in the form of a Latin cross had the unchallenged dominance. In this period exactly, individual rotunda churches, which can be related to the type that is conditionally called the ‘basilican rotunda’, were erected. An example of the most significant building among such Western European rotundas was the abbey church in Charroux (France, the 11th century) with an adjacent three-aisled basilica.

The Italian Renaissance became the eon of the most consequent and various decisions in construction of centric dome buildings, though not all of these decisions had been implemented. Here we are most likely to talk about a big scientific and theoretical contribution to elaboration of this problem from both artistic and structural points of view rather than about formation of a certain typological group of rotunda churches. In this period exactly, the individual churches that we relate to the types of cross-shaped and ‘concealed’ rotunda were constructed. An example of a cross-shaped rotunda is the Church of Santa Maria della Croce in Crema (1490–1500). Its centric composition is complicated by four square chapels. An example of ‘concealed’ rotunda is the temple in Maser, one of the last projects completed by the outstanding architect Andrea Palladio (the project of 1580). Internal rotunda of this temple with a semispherical dome is not visible in external appearance of the building.

The brief typological review of rotunda churches which have been created for over two thousand years of the world architecture history allows speaking about three typological groups that have been formed. The most numerous group, that had been developing within a long period, is the group of frontal-axial rotundas. Having formed in the Ancient Rome, this type had undertaken a new development during the Renaissance period. The main element which united both the exterior content and the interior of a rotunda building in an integral composition was the dome, the size of which kept remaining inconspicuous. In this regard, the Roman Pantheon is just an exception. The problem of harmonious integrity in rotunda buildings of the changing eons had been being solved each time at a principally new compositional, structural and engineering level.

3. Typological features of rotunda churches in Russia

The period of construction of rotunda churches in Russia lasted about one and a half century from the end of the 17th century till the middle of the 19th century. At that, the period of active construction of such churches lasted for only several decades from 1770s till 1810s. [12–24] The main types of Russian rotunda churches have been determined based on the analysis of specificity of their space-planning structures. They are: multifoil, ‘clear’, cross-shaped, symmetrically-axial, tripartite-axial ‘ship-like’, triangle-inscribed, multicentric, ‘concealed’, and frontal-axial rotundas. Let us consider typological features of such churches.

Multifoil rotundas are represented by several churches, the earliest one of which is the Peter Temple of Highly Petrovsky Monastery in Moscow (1690). Eight apses are adjacent to the central octagonal building of multifoil rotunda churches. In order to create a volumetric composition, equidimensional or size-alternating apses were used along with alteration of semicircular and rectangular apses. In their space-planning decision, these churches are close to multifoil churches of medieval Caucasus. However, artistic interpretation of their architectural form is different. In contrast to Armenian and Georgian churches with tough exterior and large stone masses, narrow windows and
tapered roofing, rounded shape of exedras of Russian churches is visible not only in interior but also in exterior of the building; large rectangular apertures with graded frames and façade painting make it look light and ornate; the vault of the top is cloistered (helmet-shaped in the Peter Temple).

‘Clear’ rotundas include three baroque churches which were constructed under the influence of European secular culture. The structure of an altar is included into the rotunda building of these churches, which have the form of a circle or a polygon in their layout. Rotundas with two tiers of windows are covered with a dome with lucarnes with an illumination drum with a cupola on top. It should be noted that the Church of Nativity of the Mother of God in Podmoklovo (1714–1754) was supposedly constructed on the basis of a project of Italian architect Carlo Fontana. The image of this church with a domed faceted rotunda surrounded by an arcade of sixteen columns resembles the rotunda from the Rafael’s painting called ‘The Marriage of the Virgin’. The Church of the Mother of God is one of the most interesting buildings of the Petrine epoch; it epitomizes features of the West-European Baroque and stands out in Russian architecture of the 18th century.

Centric composition of cross-shaped rotundas goes back to rotunda churches of Europe which originated at the end of the 15th century in Italy, and later in Ukraine and Poland. This typological group is represented by a few buildings, and some of cross-shaped rotunda churches didn’t go further than a project. The first of such rotunda churches was built in Russia at the beginning of the 18th century, it was the Church of the Nativity of the God's Mother at Marfino estate (1701–1707); the rest of the churches were constructed in the first half of the 19th century. Cross-shaped layout assumes construction of a rectangular altar and porches which are adjacent to the main rotunda with respect to the cardinal directions and in majority of cases are decorated with porches.

Rotunda churches with layouts inscribed in a triangle have four rotundas in their basis: the large one in the center and three small rotundas around it. This allowed for a seamless placement of all traditional parts of an Orthodox church (the church itself, an altar and two chapels) in the new compositional content. Round shapes of the altar and the chapels of these rotunda churches are ‘hidden’ in the lower triangular tier and are not visible in the building’s exterior. As a possible origination source of these churches’ composition, I.E. Putyatin indicates the project of the ‘Temple of War’ from the albums by J.-F. de Neufforge, as well as the symbolic meaning of a triangle shape in architecture and art of Western Europe and Russia, which is the image of the holy Trinity [24].

Symmetrically-axial rotundas originated in 1760s – 1770s. Their rotunda forms are various: octagonal, eight-bladed or circular in their layouts; rotundas are covered with a closed vault or a dome. Equidimensional structures of an altar and the Western rebate, placed symmetrically in regard with the main rotunda building, are adjacent to rotundas without refectories. As a rule, the northern and the southern facades get decorated with risalits or porticos. Two symmetrically-axial rotundas, the Church of the Holy Apostles Peter and Paul at the Marfino estate (the end of 1770s) and the Temple of the Holy Great Martyr Dmitry Solunsky in Ruza (1792) represent the type that is rare for Russian architecture of the Classicism epoch: the tiered centric church ‘for the bells’ or ‘to the ding of bells’.

Spatial composition of rotunda churches constructed by the tripartite-axial ‘ship-like’ scheme is characterized by a campanile, a refectory and the main rotunda building, which are sequentially positioned alongside the west-eastern axis. These churches are very different by the structure of the main rotunda building, by the presence and the form of the altar apse, by the composition of the refectory, by the presence and location of chapels, and by the top of rotunda. The majority of churches of the end of the 18th – the beginning of the 19th century was built by this layout, whereas construction of centric churches of the earlier period was finished with regard to this scheme.

Two subgroups can be singled out among tripartite-axial ‘ship-like’ rotundas based on their composition of a refectory and the presence of chapels. The majority of these churches have two-chapel refectories combined with the three-aisled structure. The altar could be placed either inside the rotunda building or in the altar apse of various forms. These rotunda churches are characterized by complex forms of layout and multi-structure compositions. Placement of the altar inside the rotunda building reduced the already-small area of the main temple. Therefore, rotunda churches with altar apse were constructed more often. Axial tripartite space-planning compositions of rotunda churches
with a simple rectangular refectory and an altar structure equal to the refectory by its width and height were less popular. Such rotunda churches finished with a bell tower located on the West side.

**Multicentric rotundas**, which form a small typological group, are some kind of a rearrangement of the tripartite-axial ‘ship-like’ layout. Longitudinally developed complex multi-building composition of these churches is formed by a group consisting of four rotundas (a church, an apse and two chapels), a rectangular refectory, and a bell tower. Dome rotunda of the churches with two tiers of windows and the depressed altar and the chapels compose a picturesque pyramidal structure. One of the most original artworks of the mature Moscow classicism is the multicentric rotunda Church of the Holy Martyrs Kosma and Damian (M.F. Kazakov, 1791–1803). The rest of the churches in this typological group are variants of the Kazakov’s multicentric rotunda.

The exterior of ‘concealed’ rotundas does not reveal the inner rotunda of the main temple. This typological group is represented by churches that greatly vary in their space-planning compositions. For these rotunda churches, it is very difficult to single out other common typological characteristics, except for the main one: layout of their main building combines an external square outline with a round inner room; in the buildings’ exterior, the rotunda is revealed as a massive dome drum, towering above the quadrangle of the temple’s base. The presence and combination of other buildings greatly varies.

Typological group of **frontal-axial rotunda churches** is represented by several unique buildings. The theme of Roman rotunda in the image of these churches is quite apparent; their longitudinal axis is emphasized from the West by a rebate and a portico which form the entrance space in front of the domed rotunda.

The brief typological analysis of rotunda churches constructed in Russia within the short historical period from the end of the 17th century till the middle of the 19th century allows speaking about a great interest of Russian architects to rotunda shapes. Development of rotunda church architecture started from centric compositions, although the leading role belonged to the longitudinal-axial composition of combination of the main rotunda building with various structures of the other parts of a church. Out of the nine determined types of rotunda churches, the most popular type is the tripartite-axial ‘ship-like’ rotunda type. The majority of rotunda buildings in Russia have been constructed in the forms of the Classicism. Table 1 gives examples of rotunda churches in Russia and around the world, classified in accordance with their typological features.

### 4. Conclusion

In the course of research, the main typological groups of rotunda churches around the world and in Russia, which have various patterns of their space-planning structure, were determined and described. The uniqueness of Russian rotunda church architecture lies in both the chronological concentration of such architectural monuments within a short historical period and in their typological variety. In Russia, the most popular type of rotunda churches are the ones with the longitudinal-axial composition with a development alongside the West-Eastern axis. Rotunda churches with centric composition did not get widely spread in Russia; many of them were completed by refectories and bell towers later. Architectural heritage of the world was artistically comprehended and used by Russian architects without any direct adoption or copying. Balanced combination of new composition patterns with national traditions became the basis for construction of rotunda churches in Russia, which differed from round buildings in church architecture of other countries. The majority of Russian rotunda churches were constructed in the Moscow region within the period of establishment and flourishing of Classicism in Russia. In this period exactly, schools of architecture which sequentially elaborated certain types of rotunda churches from both theoretical and practical points of view have been formed.
### Table 1. Examples of rotunda churches by their types.

| Type                                      | Rotunda churches around the world | Russian rotunda churches |
|-------------------------------------------|----------------------------------|--------------------------|
|                                           | Layout                           | Information              | Layout | Information |
| **Centric rotunda churches**              |                                   |                          |        |             |
| Tholos                                    | Ancient Tholos, the Temple of Apollo, Delphi (around 580 BC) | The Three Holy Hierarchs Church, Poluektovo (the middle of 1770s–1780) |
| Multifoil rotunda                        | Zoravor Church, Yeghvard, Armenia (latter half of the 7th century) | Church of Nativity of the Mother of God, Podmoklovo (1714–1754) |
| “Clear” rotunda                          | Tempietto, Rome, Italy (Bramante, 1502) | Church of the Nativity of the God’s Mother, Marfino (1701–1707) |
| Cross-shaped rotunda                      | Church of Santa Maria della Croce, Crema, Italy (Battaglio, 1490–1500) | Church of the Vladimir Icon of the Mother of God, Vinogradovo (1772–1777) |
| Rotunda inscribed in a triangle           |                                   |                          |        |             |
| **Longitudinal-axial rotunda churches**   |                                   |                          |        |             |
| Frontal-axial rotunda                    | The Circular Temple, Baalbek, Syria (the 1st–3rd centuries) | Church of the Transfiguration of Our Saviour, Pekhra-Yakovlevskoye (1777–1782) |
| Basilican rotunda                        | Abbey church, Charroux, France (the 11th century) | Church of the Elevation of the Holy Cross, Kolomna (1764) |
| “Concealed” rotunda                     | The temple in Maser, Italy (Palladio, the project of 1580) | Church of the Holy Apostles Peter and Paul, Marfino (the end of 1770s) |
| Symmetrically axial rotunda              |                                   |                          |        |             |
| Tripartite-axial “ship-like” rotunda     |                                   |                          |        |             |
| Multicentric rotunda                     |                                   |                          |        |             |
References

[1] Lisovskiy V G 2007 Renaissance Architecture. Italy (St. Peterburg: Azbuka-klassika)
[2] Pokrovskiy N V 2000 Sketches of Monuments of Christian Art (St. Peterburg: Liga-Plus)
[3] Brunov N I 2003 Essays on the History of Architecture vol 2 (Moscow: Zentropoligraf)
[4] Vitruviy 2006 Ten Books on Architecture ed A G Gabritchevskii Repr izd (Moscow: Arhitektura-S)
[5] Baranov N V et al. 1970 All-Russian History of Architecture. The Architecture of the Ancient World vol 1, ed O H Halpahtchyan (Moscow: Stroyizdat)
[6] Baranov N V et al. 1973 All-Russian History of Architecture. The Architecture of the Ancient World. Greece and Rome vol 2, ed V F Markuzon (Moscow: Stroyizdat)
[7] Vlasov A V et al 1966 All-Russian History of Architecture Architecture of Eastern Europe. Middle Ages vol 3, ed Yu S Yaralov (Moscow Leningrad: Stroyizdat Leningrad department)
[8] Kolli N D et al. 1966 All-Russian History of Architecture. Architecture of Western Europe. Middle Ages vol 4, ed A A Guber (Moscow Leningrad: Stroyizdat)
[9] Kolli N D et al. 1967 All-Russian History of Architecture. Architecture of Western Europe 15–16 Centuries. Renaissance vol 5, ed V F Markuzon (Moscow: Stroyizdat)
[10] Koch V 2005 Encyclopedia of Architectural Styles: a Classic Work on European Architecture from Antiquity to Modernity ed A G Maksimovitch (Moscow: BMM AO)
[11] Yakobson A L 1987 Patterns in the Development of Medieval Architecture of 9–15 Centuries: Byzantium. Greece. South Slavic Countries. Russia. Transcaucasia (Leningrad: Nauka Leningrad department)
[12] Shvidkovskiy D O et al. 2007 Architecture in the History of Russian Culture. St. Petersburg and the Architecture of Russia vol 7, ed I A Bondarenko (Moscow: KomKniga)
[13] Belezkaya E A and Pokrovskaya Z K 1980 Gilardi (Moscow: Stroyizdat)
[14] Vlasuyk A I, Kaplun A I and Kiparisova A A 1957 Kazakov (Moscow: Gosstroyizdat)
[15] Maximov P N et al. 1968 All-Russian History of Architecture. Architecture of Russia, Ukraine and Belarus of the 14 – First Half of the 19 Centuries vol 6, ed P N Maximov (Moscow: Stroyizdat)
[16] Ilyin M A 1955 Kazakov: a Series of Lectures (Moscow: Gosstroyizdat)
[17] Ilyin M A 1979 Moscow and the Moscow Region. Handbook Guide (Moscow Leypzig: Art Edizion)
[18] Grabar I E et al. 1961 History of the Russian Art. Art of the Second Half of the XVIII Century vol 6, ed I E Grabar (Moscow: Publishing House of the AN SSSR)
[19] Kirizencov E I 1982 Russian Architecture of 1830-1910 (Moscow: Art)
[20] Makarevitch G V 1998 Monuments of Architecture of Moscow (Moscow: Art)
[21] Podyapolskaya E N et al. 1975 Monuments of Architecture of the Moscow Region vol 1 (Moscow: Art)
[22] Podyapolskaya E N et al. 1975 Monuments of Architecture of the Moscow Region vol 2 (Moscow: Art)
[23] Pokrovskaya Z K 1999 Beauvais Osip (Moscow: Stroyizdat)
[24] Putyatin I E 2005 The Architecture of Russian Manor Churches in the Era of Classicism the Example of Moscow Region. Dissertation of the Candidate of Architecture (Moscow: Russian State Library) p 173

Acknowledgements
The work was supported by Act 211 Government of the Russian Federation, contract No. 02.A03.21.0011.