

Construction Materials and Building Techniques in the Architecture of Medieval Rus' from the 10th to the Beginning of the 12th centuries

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Prior to the adoption of Christianity as the official religion of Rus' in 988, stone construction was not used, and as the standard building material was wood. The first stone buildings of Rus' were the Tithe Church in Kiev (989–996) (Figs. 1–4) and the adjacent palace ensemble. Here for the first time in the construction of Rus' we see the use of lime mortar with the addition of pounded fired clay laid with thin bricks (plinths) (Fig. 5). Stone (sandstone and quartzite) was used along with the bricks (Fig. 6).

Bearing in mind that when the construction of the Tithe Church began, there was no tradition of monumental building in Rus', it is understandable why a group of Byzantine masters was sent to Prince Vladimir for its erection. The chronicler describes these masons as “masters of the Greeks”.¹ Taking into account the circumstance that these masters most likely were sent to Vladimir by his father-in-law and ally, the Byzantine emperor Basil II, it is possible to assume that these “masters of the Greeks” were cosmopolitan masters from Constantinople. This is how almost all of researchers of the architecture Ancient Rus' have considered it until now.² Exactly this view was reflected in all the general works on the history of ancient Russian architecture³ and was embodied in the new fundamental edition *History of Russian Art*.⁴ But even M.K. Karger, as well as other researchers, who had no doubt about the Byzantine origins of the masters who raised the first Russian church, didn't exclude the possibility that when it was erected, “relations between Bulgarian and Russian Churches in the 10th century” played a part.⁵ However, the same scholar rightly pointed out that the construction and technical features of the Tithe Church—notably the character of its masonry walls—“can hardly suggest that the source of the characteristic properties of ancient technique of construction in Russia was Bulgaria.”⁶ In actuality, the researcher didn't consider this assertion as conclusive and accepted the possibility that “further, in-depth studying and particularly the new excavations of the ancient Bulgarian architectural monuments will contribute the new data for the solution of this issue”.⁷

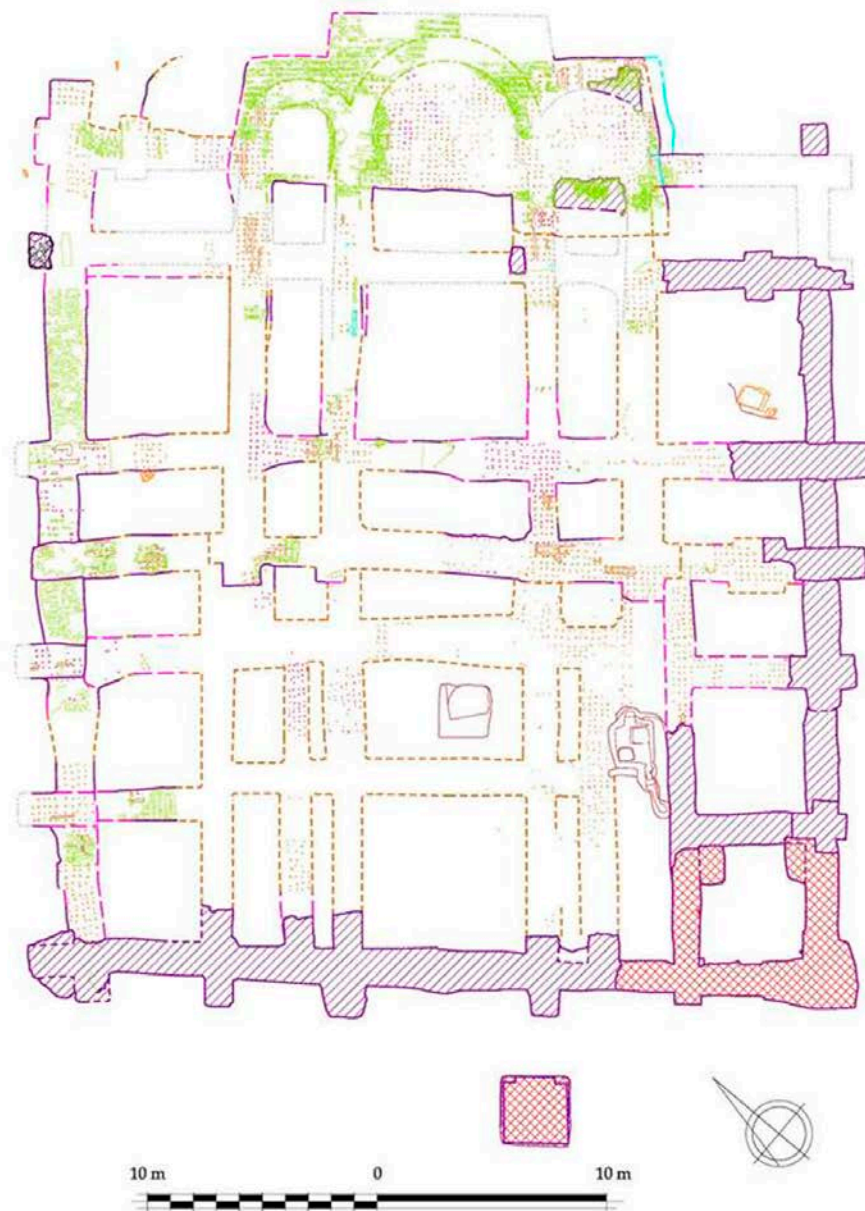


Fig. 1: The Tithe Church in Kiev. Plan according to the results of excavations in the years 2005–2011.

The main argument in favor of the Constantinopolitan origin of the creators of the Tithe Church was the character of the masonry wall discovered during its excavation, built of bricks and lime mortar in the so-called concealed course technique. Indeed, masonry with the concealed course is so characteristic for the architectural school of Constantinople in the Middle Byzantine era in particular that it is even regarded as a kind of a “calling card.”⁸ R. Ousterhout even writes “the presence of



Fig. 2: The Tithe Church in Kiev, excavations of 2005-2011. General view from the north.



Fig. 3: The Tithe Church in Kiev, excavations of 2005-2011. General view from the northwest.

recessed brick has helped to identify masons from Constantinople at work in Kiev, Chernigov, Jerusalem, and elsewhere.”⁹ P.A. Rappoport pointed out that, in Constantinople, this masonry had already gained ground in the 11th century—that is, later than it appeared in the Tithe Church.¹⁰ He explained the phenomenon of an earlier dating for the Kievan monuments with the concealed course technique by the state of knowledge of modern researchers on the 10th century architecture of



Fig. 5: The Tithe Church in Kiev, excavations of 2005-2011. General view from the southwest.



Fig. 4: Tithe Church. Masonry unit of thin brick on lime mortar.

Constantinople, rather than the situation with the architectural and construction practices of 10th and 11th centuries: “The monument of Byzantine architecture of the second half of 10th century practically never had been studied, and there was not a single monument preserved from between the middle of 10th and the third quarter of 11th centuries in Constantinople.”¹¹ Noting that masonry with concealed courses was recorded in the fragments that were found during the excavations of the Tithe Church, the researcher made a very fair conclusion that “thus, there is no doubt that the technique referred to was actually used in Russia at the end of 10th century. Consequently, it has been applied in Byzantium in earlier times.”¹²



Fig. 7: Tithe Church. Foundation masonry with thin brick and stone.

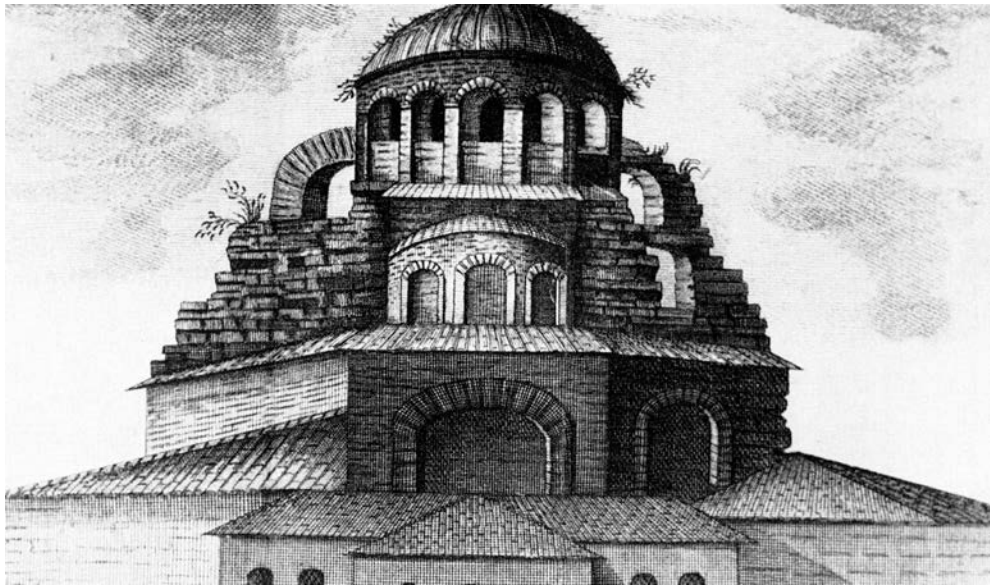


Fig. 6 Constantinople, Church of Christ in Chalke. Engraving of the 18th century. (from W. Müller-Wiener).

The same conclusion was reached by the Austrian scholar, H. Schäfer,¹³ and followed to him, by the Greek researcher P. Vocotopoulos.¹⁴ In 1977, W. Müller-Wiener published a previously unknown drawing from the end of 18th century¹⁵ depicting the Church of Christ in the Chalke in Constantinople, also known under the Turkish name of Arslanhane, which was built in 970s by the Emperor John Tzimiskes and no longer survives. This drawing has been used to confirm the



Fig. 9: Constantinople, Church of the Pantokrator. Masonry with the concealed course technique.



Fig. 8: Constantinople, Church of Pantokrator. Bricks with beveled edges in the concealed course technique masonry.

above-mentioned assumptions. The drawing clearly shows parts of masonry walls of this church, composed of the concealed course technique.¹⁶ Anyway, in the latest study of R. Ousterhout there is no doubt about the possibility of confidently date the origin of masonry with the concealed course technique in Constantinople by 10th century, and to assume that in Kiev it was introduced by Constantinopolitan masters.¹⁷ At the same time, it should be noted that the pattern of the image of the Church of Christ in the Chalke on the drawing published by Müller-Wiener (Fig. 7) does not allow an unambiguous interpretation of the masonry as having the con-

cealed course technique—it could easily be interpreted as a typical Byzantine building with many phases, and the striped masonry could also indicate where rows of stone alternate with courses of bricks.

Moreover, it has to be noted that Constantinopolitan masonry with the concealed course technique known from the surviving monuments of 11th and 12th centuries is different from what we see in a blocks of the Tithe Church. In Constantinople the hidden course that was made of a thin (2–3 cm) brick with the beveled molding at the edges, enclosed between two rows of bricks of 3–5 cm thick (see, for example, masonry Church of Christ Pantokrator (Zeyrek Camii)¹⁸ (Figs. 8-9). In the Church of Tithes all rows were composed of bricks of the same thin form.

The only monument of Constantinople known to me where the brickwork is fully identical to the masonry of the Tithe Church is a ruined foundation that was completely unknown before it was discovered in 1998–1999 under the carpet store “Sedir,” located near the Hippodrome.¹⁹ (Figs. 10–11) Researchers have linked them to the Church of Virgin Hodegetria and dated to 11th or even the early 12th



Fig. 10: Constantinople, ruins of an unknown Byzantine building under the carpet shop “Sedir,” next to the Hippodrome. Masonry with the concealed course technique.



Fig. 11: Constantinople, ruins of an unknown Byzantine building under the carpet shop “Sedir” next to the Hippodrome. Brick with a beveled edge.

century.²⁰ Thus, the Tithe Church is still the only known monument of the Middle Byzantine era, in which we have brickwork with a concealed course at the end of 10th century.

To some extent, the bricks with Greek stamps could be considered as the evidence of the origin of masters from Constantinople; these were found during excavations in 1908–1912, during excavations in 1939, and in the course of the recent excavations of the Tithe Church, conducted in 2005–2011 (Fig. 12–13).²¹ The stamping of bricks was widespread in Byzantium and particularly in Constantinople.²² However, this tradition is characterized mainly for the early Byzantine era—that is, for 4th–6th centuries. As noted by R. Ousterhout, “Evidence of brickstamps



Fig. 14: Tithe Church. Brick with a Greek stamp.



Fig. 13: Tithe Church. Brick with a Greek stamp.



Fig. 12: Tithe Church. Brick with a Slavonic inscription.

from after the Transitional is very limited.”²³ The researcher also notes that only some of the marked bricks may relate to 10th–11th centuries.²⁴ If the Constantinopolitan tradition of brick stamping had ended by the time the Tithe Church was built, it still was continuing in the provinces,²⁵ but the brick stamps of the 10th–11th centuries, and especially the brick stamps of Byzantine provinces, are still very poorly studied. Therefore, the presence of Greek stamps on bricks of the Tithe Church may affirm that it was, indeed,

constructed by “master of the Greeks,” but this fact cannot be unambiguously interpreted in favor of their Constantinopolitan origin.

A possible “Bulgarian trace” in the history of the construction of the Tithe Church is found in two bricks of 10th century, which were found in 2007 in the filling of the fortification ditch of Old Kievan city near the northwest corner of the Tithe Church. The Cyrillic inscription consisting of two letters “Щ” and “И” (Fig. 14), plotted on their bed sides even before firing. Most likely they represented a number, perhaps the batch numbers of bricks. It is hard to believe that only one year after the adoption of Christianity in Kievan Rus’ there were so many educated brickmakers who could apply such an inscription on the brick. Most probably the inscription was left by a foreman from Bulgaria which took part in construction.

In fact, the Tithe Church relates to the Bulgarian monuments of 10th–11th centuries through a similar system of foundations and, especially, the substructures beneath them, which compare with the foundations of martyrrium under the Large Basilica in Pliska.²⁶ Unfortunately, we do not know whether there were similar



Fig. 15: Tithe Church. Unused foundation ditch (shown by arrows).

substructures in the construction of Constantinople. The reason for this lies in the fact that most of the monuments of Constantinople have not been investigated at the level of foundations. Therefore, it cannot be excluded that such system of foundations construction also was used there.

After the construction of the Tithe Church, such system of foundations with the substructures under their feet became standard in the construction of Rus' and was used during the 11th and the first quarter of the 12th century. In the buildings of the Kievan Rus' of this time (in Kiev, Pereyaslavl and Novgorod) a system of "belt" foundations was used, in which the wall foundations were connected with the foundations of pillars and pilasters supporting the vaults and domes (see

Fig. 1). As a result, the foundation of the building as a whole acquired the form of a grid, in which ribbons of the foundation extend not only under the walls and supporting structures, but across the open spaces of the building as well. During the examination of the ruined buildings, when the archaeologists have only the foundations, such a grid system gives the possibility of imagining the system of the vaulting of the lost building. For example, during the last excavations of the Tithe Church in 2005–2011, very important conclusions were made during observations of the nature of the foundation ditch, extending through the eastern pair of pillars (Fig. 15).²⁷ This ditch was dug by the builders of the church, but they did not lay a foundation in it. The ditch was left unused, reflecting the changing of architects' conception in course of construction and suggesting that there was no wall separating the sanctuary and the eastern corner compartments (pastophoria) from aisles space.

In turn, this indicates that the naos of the church had no dome, which would have required bracing on all four sides. With the absence of the wall between the naos from the sanctuary and pastophoria, the aisle vaults could extend only in the direction parallel to that of the central nave vault. In other words, the Tithe Church as it was built in 989-996, was not a cross-in-square church but a basilica, and probably basilica with the transept (Fig. 16). This transept should be seen as a transversal nave. Nevertheless, the fact that the builders of the church dug a ditch for the wall that could separate the sanctuary and pastophoria from the nave probably indicates that their initial plan was to create cross-in-square church. Later, however, from the middle of 12th century on, Russian master builders abandoned the use of the grid system of foundations and began to use a system of independent foundations under the walls and piers.

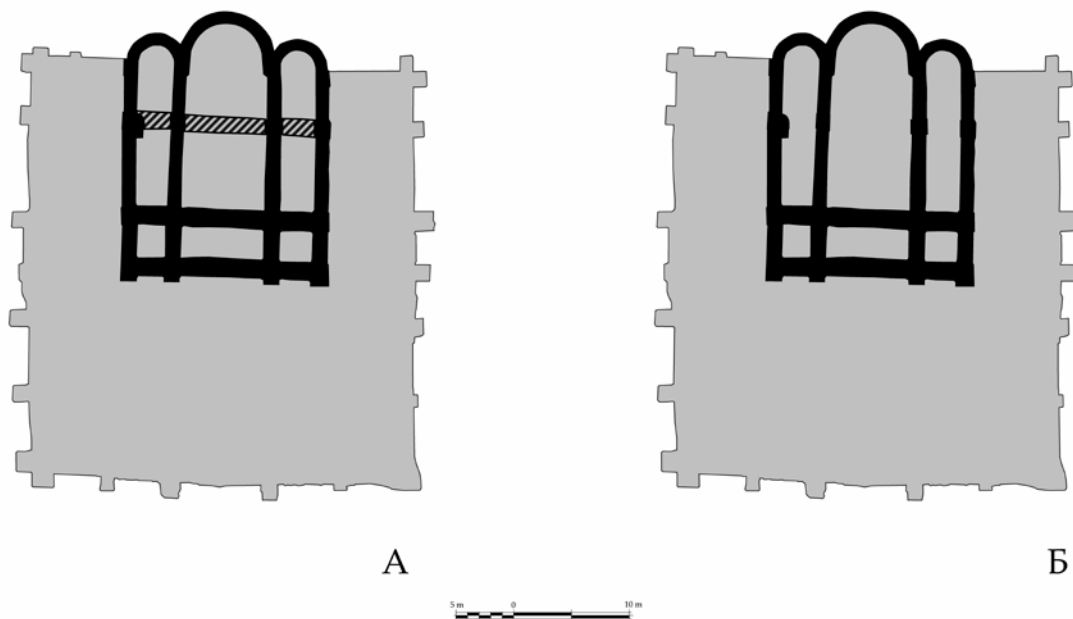


Fig. 16: Change in the structure of the central nucleus of the Tithe Church as a result of the refusal by the builders of using of the east cross foundation

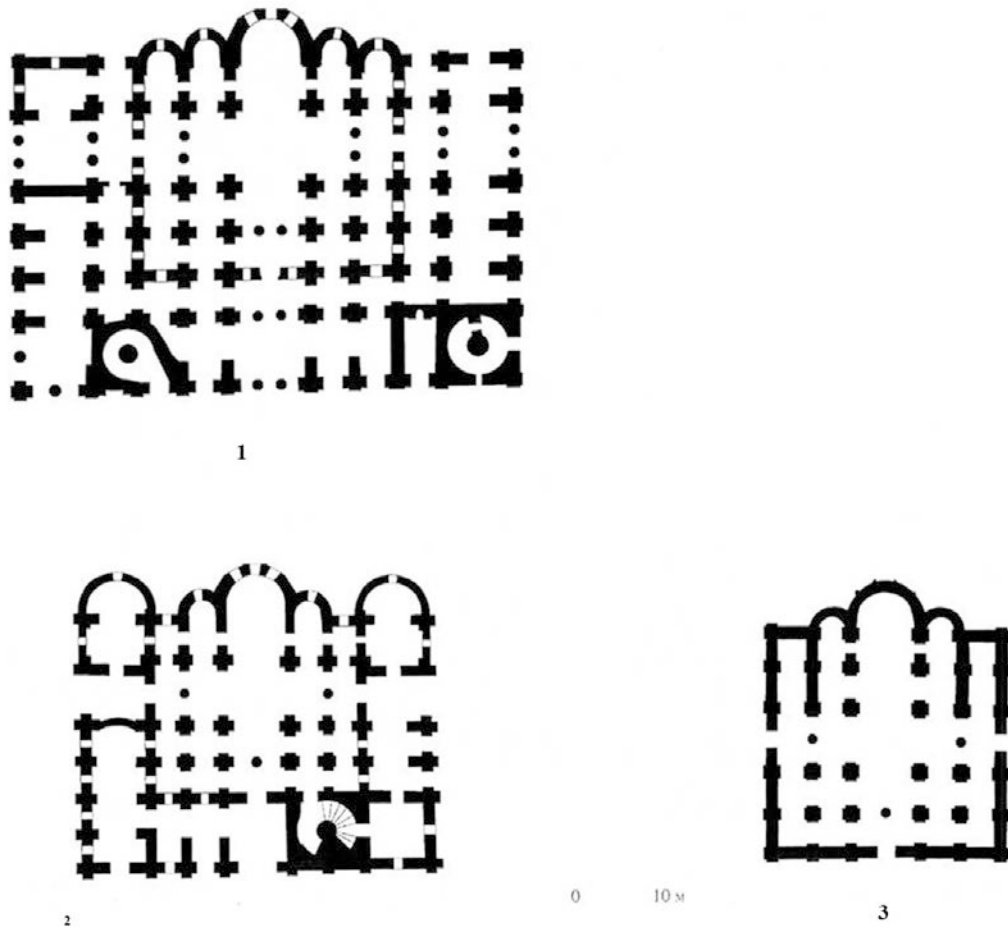


Fig. 17: Saint Sophia cathedrals in Kiev (1), Novgorod (2), and Polotsk (3).

Focus on Constantinople and the use of cross-domed type becomes notable for Kievan Rus' only in the mid 11th century with the construction of the Sophia Cathedrals in Kiev, Novgorod and Polotsk, and other Kievan buildings of the middle and the second half of 11th century (Fig. 17). But the architectural style of these buildings, representing complicated spatial five-aisled structures, has no direct analogies in architecture of Byzantium.

The size of bricks also was changed. They continued to remain flat as a plinth but became thicker than in the Tithe Church. The standard thickness now was up to 4–5 cm. The edges of the bricks became vertical. Throughout of the 11th and the first quarter 12th century in Kievan construction practice a typically Constantinopolitan masonry system was used, of *opus mixtum* with a concealed courses (Fig. 18). It should be noted, that masonry of Saint Sophia in Novgorod has some differences from the masonry of Saint Sophia in Kiev. They are manifested in an advantageous use of stone in the Novgorod cathedral (Fig. 19–20). In Saint Sophia in Novgorod the bricks were used only in the façade decoration and in the most important structural details, the arches and vaults.



Fig. 19: Saint Sophia Cathedral in Kiev (ca. 1037). Detail of the façade.



Fig. 18: Saint Sophia Cathedral in Novgorod (ca. 1045). Detail of the façade.

At the Cathedral of St. Sophia in Polotsk a different type of brick was used, which finds analogies in bricks of Chernigov of the late 11th century. In turn, this gives grounds to assume that the Cathedral of St. Sophia in Polotsk was built later than other St. Sophia cathedrals of Old Rus'. The St. Sophia cathedrals at Kiev and

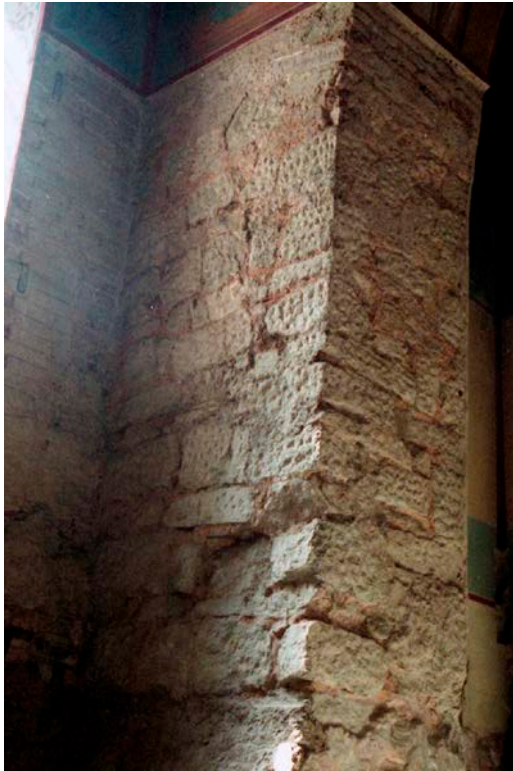


Fig. 21: Saint Sophia Cathedral in Novgorod. Detail of the masonry.

especially at Novgorod served as models, copied by the creators of the Cathedral of Polotsk.

A new construction tradition in Old Rus' begins in the second half of 11th century in Chernigov. At that time, there appears is a new tradition of making bricks on which the brickmakers begin to put marks on the exposed surface (Fig. 21). According to the opinion of P.A. Rappoport, these served to denote the number of the brick's batch before firing.²⁸ The concealed course technique also became different from the Kievan examples. Intermediate (concealed) courses of brick are set back only very slightly from the façade surface. It sometimes encouraged researchers to term the masonry of these monuments as equicourse masonry ("course by course"). However, the architectural forms of buildings of this time in

Chernigov, at the Prince's Palace Tower ("terem") and the burial church, remained associated with architectural traditions of Constantinople and Kiev.



Fig. 20: Chernigov, Saviour Cathedral (end of the 11th century), south chapel. Brickstamp.



Fig. 22: Chernigov, Cathedral of Saints Boris and Gleb (first third of the 12th century).

At the turn of the 11th and 12th centuries, the format of the brick changed considerably in the construction of Chernigov. Bricks became thicker: 2.7 to 4.2 cm. The proportion of bricks also changed. Their length is significantly increased relation to their width. Kievan were almost square, but Chernigovan bricks became more elongated. The proportions vary between 1:1.3 and 1:1.4.²⁹

The master builders of Chernigov used the architectural type of the inscribed cross church with articulated façades that replicated the semicircular shape of vaults, as had first appeared in the Dormition Cathedral of the Kiev Pechersky Monastery. But architectural style changed significantly with the introduction of features derived from Romanesque architecture: semicolumns appear on the façades, completed with typically Romanesque capitals, arcades, and with cross-vaults on the interiors. Thus in the architecture of Chernigov we can see the combination of the Byzantine form and Romanesque style (Fig. 22). But the most significant change comes in the character of masonry. *Opus mixtum* masonry with the concealed courses is no longer in use. It is replaced by the equicourse masonry ("course by course") (Fig. 23).³⁰

By the 1130s, Chernigov's style and masonry technique had penetrated Kiev itself. And after 1140, when the dynasty of princes from Chernigov occupied the throne of Kiev, the new architectural tradition completely replaced an old Kievan tradition, which by that time had moved in Polotsk.³¹ From the early 12th century, Novgorod fully followed Kievan architectural traditions, but the proportion of stone in the construction of the walls are significantly higher than that of brick. The most significant changes in construction materials in the 12th century, however, happen in the southwest of Rus' in the foothills of the Carpathian Mountains.



Fig. 24: Chernigov, Cathedral of Saints Boris and Gleb. Masonry using the equicourse technique.



Fig. 23: Pereslavl-Zalessky, Spaso-Preobrazhensky Cathedral (ca. 1152).

Here, on the lands of the principalities of Przemysl and Terebovla, which in the middle of the 12th century united under the authority of the Galician princes and became the Galician Principality, the construction of stone churches and palaces begins at the start of 12th century (Przemysl, Zvenigorod Galitsky, Galich).³² The masonry of these buildings is significantly different from the masonry elsewhere in medieval Rus'. Galician master builders used masonry made of cut stone limestone, characteristic of Romanesque architecture. This technique of masonry was introduced by masters from neighboring Poland.³³

In turn, Galician master builders introduced Romanesque masonry to the northeast of Rus', in the Principality Vladimir-Suzdal, by the middle of the 12th century (Fig. 24).³⁴ During the 12th and 13th centuries, the Galician

and Vladimir-Suzdal workshops experienced more than once the impact of Romanesque architecture: Galich was influenced from Hungary, and Vladimir from Italy, and subsequently southwestern France.³⁵ However, if the of masonry and construc-

tion techniques in the architecture of these principalities were derived from Romanesque architecture, the typology of the buildings depended on the traditional architecture of Rus', which had developed in Kiev by the second half of 11th century.

NOTES:

¹ *The complete collection of Russian Chronicles* 1997 [Полное собрание русских летописей], vol. 1. (Moscow), 121.

² See, for example, such works as: Comech, A.I. 1987. *Old Russian architecture of the end of X-the beginning of XI century. The Byzantine heritage and the formation of an independent tradition* [Комеч, А.И. Древнерусское зодчество конца X-начала XI в. Византийское наследие и становление самостоятельной традиции] (Moscow), 177; Rappoport, P.A., 1984. "On the role of Byzantine influence in the development of ancient Russian architecture," *Byzantine Annals*, 45, 187 [Раппопорт, П.А. «О роли византийского влияния в развитии древнерусской архитектуры», *Византийский временник*, 45, 87]; idem 1986. *Architecture of ancient Rus'* [Раппопорт П.А., *Зодчество Древней Руси*] (Leningrad), 17; idem 1993. *Old Russian Architecture* [Раппопорт, П.А. *Древнерусская архитектура*] (Saint-Petersburg), 30; Wagner, G.C. 1990. *The Art of Thinking in Stone. The experience of functional typology of monuments of ancient Russian architecture* [Вагнер Г.К. *Искусство мыслить в камне. Опыт функциональной типологии памятников древнерусской архитектуры*] (Moscow), 32; Ioannissian, O. 1996. "Architecture of ancient Rus' from the Tithe Church until the Mongol invasion" in *The church of Virgin Mary (the Tithe church) in Kiev*, [Иоаннесян О., 1996. "Зодчество Давньої Русі від Десятинної церкви до монгольської навали (традиції, зв'язки, розвиток)", *Церква Богородиці Десятинна в Києві*] [ukr.] (Kiev), 37–38.

³ Voronin, N.N. 1953. "Architecture of Kievan Rus'" in *History of Russian Art*, vol. 1 [Воронин, Н.Н. "Зодчество Киевской Руси", *История русского искусства*] (Moscow), 118; Brunov, N.I., 1956. "Architecture of Kievan Rus'" in *History of Russian Architecture* [Брунов, Н.И. 1956. "Архитектура Киевской Руси", *История русской архитектуры*] (Moscow), 21, 27–29; Asejev, J.S., Maksimov, P.N. 1966. "The stone architecture of the end of 10th-the first half of the 11th century" in *The General History of Architecture in 12 volumes*, vol. 3 [Асеев, Ю.С., Максимов, П.Н. 1966, "Каменное зодчество конца X-первой половины XI в.", *Всеобщая история архитектуры в 12 томах*] (Leningrad-Moscow), 534; Sopotsinsky, O.I., Vasilenko, V.M., 1973. "The art of ancient Rus'" in *The History of Art of the Peoples of the USSR*, vol. 2 [Сопотинский, О.И., Василенко, В.М., 1973. "Искусство Древней Руси", *История искусства народов СССР*] (Moscow), 328; Tiajelov, V., Sopotsinsky, O. 1975. *Art of the middle ages. Byzantium, Armenia and Georgia, Bulgaria and Serbia, Ancient Rus', the Ukraine and Belarus* [Тяжелов, В., Сопотинский, О. 1975. *Искусство Средних веков. Византия, Армения и Грузия, Болгария и Сербия, Древняя Русь, Украина и Белоруссия*] (Moscow-Dresden), 193; Voronin, N.N., Rappoport, P.A., 1991. "Architecture" in *History of Russian Art in 3 volumes*, vol. 1 [Воронин, Н.Н., Раппопорт, П.А. "Архитектура", *История русского искусства в 3-х томах*] (Moscow), 9-10; Kolpakova, G. 2007. *The Art of ancient Rus'. Premongolian period* [Колпакова Г. *Искусство Древней Руси. Домонгольский период*] (Saint-Petersburg), 32.

⁴ Comech, A.I. 2007. "The architecture of the end of 10th-the middle of 11th century" in *The History of Russian Art in 22 volumes*, vol. 1 [Комеч, А.И. 2007. "Архитектура конца X-середины XI века", *История русского искусства в 22-х томах*] (Moscow), 127.

⁵ Karger, M.C. 1958–1961. *Ancient Kiev*, [Каргер М.К. *Древний Киев*] (Moscow-Leningrad), vol. 2, 92.

⁶ Ibid.

⁷ Ibid.

⁸ Ousterhout, R. 1999. *Master Builders of Byzantium*. Princeton University Press (Princeton, New Jersey), 174-179.

⁹ Ibid, 179.

¹⁰ Rappoport, P.A., 1984, 186.

¹¹ Ibid, 186–187.

¹² Ibid, 186.

¹³ Schäfer, R. 1973/1974. "Architekturhistorische Beziehungen zwischen Byzanz und der Kiever Rus im 10. und 11. Jahrhundert," *Istanbuler Mitteilungen* 23/24, 197–224.

¹⁴ Vocotopoulos, P.L. 1979. "The concealed course technique: further examples and a few remarks," *Jahrbuch für Österreichische Byzantinistik* 28, 254–60.

¹⁵ Müller-Wiener, W. 1977. *Bildlexicon zur Topographie Istanbuls: Byzantion - Konstantinopolis - Istanbul bis zum Beginn des 17. Jahrhunderts*. (Tübingen), 81, fig. 62.

¹⁶ Lipatov, A.A. 2003. "The Church of Christ in the Chalke and the concealed course technique of masonry," *Relic* 3, 48–53 [Липатов А.А., 2003. Церковь Христа Спасителя в Халке и техника кладки с утопленным рядом, *Реликвия*], 3, 48–53.

¹⁷ Ousterhout, R. 1999, 174.

¹⁸ Mango, C. 1975. *Byzantine Architecture* (New York), 243-246; Müller-Wiener, W. 1977, 209–15; Freely, J., Çakmak, A. 2004. *Byzantine Monuments of Istanbul* (Cambridge), 211–220.

¹⁹ Düzgüner, F. 2004. *Iustinianus dönemi'nde İstanbul'da yapilar: Procopius. Birinci kitap (analiz)* (Istanbul), 118–125; Kostenec, J. and Tayfun Öner, A. (2007), *Walking thru Byzantium* (Istanbul), 77–79.

²⁰ Düzgüner, F. 2004, 119–125; Kostenec, J., Tayfun Öner, A. 2007, 78.

²¹ Karger, M.C. 1958, vol. 1, 455, pl. LXXX; Rappoport, P.A. 1995, *Building the Churches of Kievan Russia* (Cambridge), 38–46; Ivakin, G.Yu., Ioannissian, O.M. 2008, "The first results of the study of the Tithe Church in 2005–2007 years," in "*Dneslovo*": *A collection of papers in honor of the real member of the National Academy of Sciences of Ukraine P.P. Tolochko to his seventieth birthday* [Івакін, Г.Ю., Іоанніс'ян, О.М. 2008, "Перші підсумки вивчення Десятинної церкви у 2005–2007 рр." In *«Дньсеслово»: Збірка праць на пошану дійсного члена Національної академії наук України Петра Петровича Толочко з нагоди його 70-річчя*] (Kiev), 204, 207, fig. 15; Yolshin, D.D., Evdocimova A.A. 2009, "Bricks with Greek stamps from the excavations of the Tithe (Desjatinnaya) church in Kiev" in Be-ліаєв L. (ed.), *Archeologia abrahamica* [Ёлшин, Д.Д., Евдокимова, А.А. 2009, "Плинка с греческими клеймами из раскопок Десятинной церкви в Киеве" in Беляев (ed.) *Archeologia abrahamica*], (Moscow), 203–211.

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- ²² Ousterhout, R. 1999, 132.
- ²³ Ibid.
- ²⁴ Ibid.
- ²⁵ Mango C. 1950 “Byzantine Brickstamps,” *American Journal of Archaeology*, 54, 19–27; A. Kazhdan, A. (ed.) 1991–96. *Oxford Dictionary of Byzantium*. (Oxford), vol. 1. 322–23.
- ²⁶ Georgiev P. 1993, *Martyrium in Pliska and the beginning of Christianity in Bulgaria* [Георгиев П. 1993, *Мартриумът в Плиска и началото на християнството в България*] (Sofia), 43.
- ²⁷ Ivakin G. Yu. and Ioannissian O.M. 2009, “The Tithe Church in Kiev: «old look» in a new light” in Beliaev L. (ed.), *Archeologia abrahamica* [Ивакин Г.Ю., Иоаннисян О.М. 2009 “Десятинная церковь в Киеве: «старый взгляд» в новом освещении” in Beliaev L. (ed.), *Archeologia abrahamica*] (Moscow), 189–91.
- ²⁸ Rappoport P.A. 1995, *Building the Churches of Kievan Russia* (Cambridge), 31–46.
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- ³⁰ Ioannissian O.M. 2007, “On the origin, datings and chronology of the Chernigov architecture of XII century” [Иоаннисян О.М. 2007, “О происхождении, датировках и хронологии черниговского зодчества XII века”] *Ruthenica*, 6, 134–88.
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