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EARLY CHRISTIAN BASILICAS IN CRIMEA AND THEIR NUMERIC PROPORTIONS

1. *Introduction.*

This study is a modified and expanded excerpt of a larger study which examines proportions of Christian basilicas in most regions of the Mediterranean and Black Sea basins and the Caucasus region from the 4th century to the 7th [1]. It focuses upon *numeric* rather than *geometric* proportions[1], which may also have been employed in some examples but were not investigated. The focus of this study is to determine the extent to which numeric proportions were employed in Christian basilicas of Crimea and the specific proportions which were applied; it also attempts to explain why certain proportions may have been chosen by the builders.

Early churches of Crimea, as of many other regions were frequently constructed of roughly cut ashlar masonry and large amounts of rather coarse mortar, at times with occasional bricks or brick courses; wall surfaces are thus often irregular and at times difficult to define precisely. Moreover, often only the foundations and lower masonry courses were preserved. Probably because of construction inaccuracies or preexisting site conditions walls and colonnades were not always truly straight and at times stood askew. Indeed, accuracy appears not to have been an important criteria when many early churches were erected. Thus measurements between "parallel" walls and colonnades at different locations within the basilica may yield somewhat different results. The known dimensions of the basilicas are therefore usually only approximate. Moreover, probably minor errors occurred not only in the layout of walls and colonnades but also in the application of the proportions.

Also, most of the proportions identified in the churches of Crimea (and elsewhere) were measured in published floor plans which usually simplify conditions in the field:

[1] In this study *numeric* proportions consist of ratios of whole numbers while *geometric* proportions are constructed of geometric configurations such as squares or circles and their derivates. Other definitions of these terms were used in Antiquity and are at times used in recent investigations.

walls are usually represented as straight lines which meet at right angles even when they are not truly straight or stand askew. At times in published floor plans components of the basilica which are unknown or not fully known are restored by conjecture and some floor plans fail to differentiate between architectural components constructed during different building phases. Moreover, distortions may occur in floor plans when they are transferred from the drawing board (or more recently from the computer) to the printed page. These limitations to the accuracy of the identified proportions must be considered in any study of proportions of early Christian basilicas. Thus the proportions provided in this study are approximate and some could be fortuitous or erroneous.[2] Nevertheless, numeric proportions were identified not only in a rather large number of basilicas but also, when possible, in different published floor plans of the same basilica, making it probable that most of the identified proportions were actually intended and employed by the builders.

In the proportions provided below the number reflecting the *width* of an architectural component comes before that reflecting the *length*. The width is always the shorter dimension and the length the longer dimension: for instance, when the proportion of the nave is 1:3, one reflects the width of the nave and three the length. Widths and lengths of building components may be measured to different points of walls and columns: the builders could measure the proportioned dimensions to the interior or exterior faces of the walls or columns or to their centers. Therefore the following abbreviations are usually provided in parentheses after numeric proportions: (cl.) for measurements of *clear* dimensions, to the inner faces of the walls or columns; (ext.) for measurements to *exterior* faces of walls; (o.c.) for measurements *on centers,* to the centerlines of walls or columns.

Since builders need not always have been consistent a proportion may be composed of dimensions measured to different measuring points; for instance, some naves are proportioned 1:3 (o.c./cl.), indicating that the width is measured to the centerlines of the colonnades and the length to the inner faces of the eastern and western nave walls. These inconsistencies could have been caused by measurements made during different construction stages, since not all dimensions need have been laid out before construction commenced. Moreover, the coordination of several proportions in the same basilica may at times have been difficult and measurement to different points of the walls or columns could have given the builders more leeway, making it easier for them to lay out the building.

2. *The Christian Basilicas.*

Although the numerous Christian basilicas excavated in Crimea seldom appear

[2] Dimensions of the local measuring system are erroneously thought by some scholars to be required before proportions can be determined; the determination of original measuring systems is not a goal of this study.

in accounts of early Byzantine architecture, they are of special interest because so many are known within a relatively limited geographic area (Fig. 1). The remains of eleven basilicas were investigated in Chersonesos in southwest Crimea (known only as Cherson since the 6th century [2, p. 43-48]), one of the largest ancient and medieval cities of the northern Black Sea coast (Fig. 2). Two basilicas were excavated in the mountains of southwest Crimea, on the plateaus of Mangup-Kale and Eski-Kermen. The early phase of a basilica in Partenit on the south coast is similar to other basilicas of Crimea. Only foundation fragments of a basilica were excavated underneath the medieval church of St. John the Baptist in Kerch, the former city of Bosporus in eastern Crimea [3, p. 388, 390]. However, remains of a basilica are known in Tyritake, a town of the former Kingdom of Bosporus. These basilicas provide an excellent "thumbnail sketch" of the evidence of numeric proportions of early Christian basilicas within a single limited well defined region.

Medieval Basilicas of Crimea differed from the early basilicas and are only occasionally referred to in this study. For instance, remains of churches with a nave, two aisles and three apses were excavated at settlements of the 8th-9th centuries near the villages Povorotnoe, Goncharnoe, Golubinka (Pampuk-Kaj hill) in southwest Crimea and in a settlement of the 8th – 11th centuries on Tepsen' hill near Koktebel' in southeast Crimea.

The basilicas are known only from excavations and their remains are limited to the lowest portions of the buildings, occasional mosaic floors and carved members. Thus only the proportions of their floor plans, not of their elevations can be determined. Many of the excavations were carried out in the 19th and beginning of the 20th century, before sophisticated archaeological methods became current and the excavations were often poorly recorded. Thus for many basilicas not only firm documentary but also archaeological evidence is scarce or absent; at times questions of chronology and specific function can be answered only generally or by conjecture. The floor plans of the excavated Christian basilicas of Crimea are very similar: most were erected with a nave, two aisles, a single projecting apse, narthex, occasionally an exonarthex and once, with an atrium. Additional apses, chapels and various ancillary facilities as well as other changes and transformations are attributed to later construction periods. Therefore usually differences in the forms of the basilicas cannot serve as chronological indicators.

Portions of some basilicas were excavated during different periods stretching over more than a century and some basilicas were re-excavated many decades after their initial, early excavation. Several floor plans of these basilicas therefore exist, at times published over a period of more than a century. Floor plans of the same basilica therefore often diverge, at times slightly but at other times considerably. The proportions were evaluated in each of the known floor plans including some which are unpublished in archives. Most proportions were identified in as many as four different floor plans and differed only minimally: for instance, in one floor plan a proportion

may have been dimensioned to wall centers while in another it was dimensioned to the clear faces of the walls, implying that the differences in the drawings represent about half the wall thickness or perhaps 0.30-0.50 m.

The largest known Christian basilica of Chersonesos and one of the most prominent, located on a bluff above the northern coastline to be seen from the open sea is **Church No. 23**[3], commonly called the **"Uvarov Basilica"** (Fig. 3). It was first excavated by Count A. Uvarov in 1853 and excavation continued intermittently until 1910; additional investigations took place in the 1970s and 1980s [4, p. 73-96; 5, p. 152; 6, p. 304-311; 7, p. 225-226; 8, p. 71]. The basilica was probably constructed after 570 as the Cathedral and may well have been dedicated to St. Peter or to Sts. Peter and Paul [9, p. 53-56; 7, p. 72-73; 10, p. 785-786]. The chronology depends upon a coin of Emperor Justin II (565-578) or Maurice (582-602) found in 1901 in a well under the west wall of the narthex [4, p. 80; 6, p. 304-306; 10, p. 768-769; 11, p. 71-73; 12, p. 273; 7, p. 225]. Other scholars have dated the basilica to the 7th century [13, c. 40, 96] and alternatively to the middle or second half of the 5th century, based primarily upon Ionic impost capitals found during the excavations [14, p. 121-125, pl. VII; 5, fig. 51, p. 160; 15, p. 47-49; 8, p. 74; 16, p. 156; 17, p. 189-190]; but the capitals can also be dated to the 6th century and need not date the church [18, p. 75, 78, № 98, 100, 127-132]. The 4th century date proposed by some scholars [19, p. 17-18] for the Uvarov as well as other Chersonesos basilicas is obsolete and not based upon adequate evidence.

The dimensions of the basilica are: exterior length with apse and both narthexes, ca. 52.50 m.; exterior width, ca. 22.40 m.; nave length ca. 30.35 m. [20, p. 149-151, fig. 44]. Its nave, aisles and inner narthex together are proportioned 1:2 (o.c./ext.); nave and aisles together, 2:3 (o.c.); nave and apse together, 1:3 (o.c./cl.); width of one aisle and that of the nave, 1:3 (cl.); width of the nave and that of the basilica, 1:2 (cl./ext.); narthex, 1:2 (ext.); width of the narthex and that of the nave, 1:1 (ext./cl.); width of the exonarthex and that of the narthex, 1:2 (o.c.). Thus all major dimensions of the basilica are coordinated by proportions composed of the first three numbers: 1:1, 1:2, 1:3 and 2:3.

Similar proportions were employed in the construction of **Church No. 13**, the **"West Basilica"** (Fig. 4), erected at the northwest edge of Chersonesos between the Ancient and Early Byzantine city walls; it could have been part of a monastic complex. The basilica was excavated in 1891, 1892 and 1901 by K. K. Kostsyushko-Valyuzhinich and additional investigations were carried out in 1963 by E. G. Surov [4, p. 51-73; 21, p. 29-42; 22, p. 160-181; 5, p. 160; 23, p. 327; 24, p. 39-43]. It was probably erected no earlier than the mid 6th century: a terminus post quem is provided by a coin of Justinian I and a bowl fragment Form10A LRC dated after A.D. 550 [25, p. 15] found in Cistern No. 33, used for salting fish, which was filled when the basilica was

[3] The Church numbering system is from the Imperial Archaeological Commission [21, fig. 1, a site plan of Chersonesos].

constructed [23, p. 327-329, 340-341; 26, p. 127; 27, p. 112; 28, p. 89, 92; 29, p. 114]. Some scholars dated the basilica to the end of the 5th century or the first half of the 6th century [5, p. 160-164, fig. 67; 30, fig. 1a (erroneously titled "East Basilica"); 15, p. 56-58, fig. 8]; still others dated it to the end of the 6th – beginning of the 7th century [12, p. 278; 11, p. 79, 81-83, 85, fig. 23-1 (erroneously titled Basilica 36); 24, p. 41; 10, p. 828] or to the end of the 7th – beginning of the 8th century [31, p. 537; 13, c. 60, 96]. The basilica was probably dedicated to St. Leontius since the House or Church of Saint Leontius was mentioned in the *Word about transference of the relics of St. Clement and in the Vita cum Translatione Sancti Clementis (Legenda Italica)*: according to the reasonable interpretation of A. Romanchuk, after finding the relics on the small island in Kazachia Bay a procession arrived at Cherson from the west; the first church encountered was the church of St. Sozon ("in templo S. Sozontis") close to the city wall, probably the Cruciform Church of the western suburbs; the second church, "The House or Church of Saint Leontius" ("ad ecclesiam S. Leontii"), probably the West Basilica; the third church, the Cathedral ("ad majorem basilicam"), now the Uvarov Basilica [12, p. 279-280; 7, p. 73; 10, p. 827, 847-849, 1454].

The exterior of the apse of the West Basilica is five-sided and according to the reconstruction proposed by M. Skubetov, based upon a column base found in situ in the excavations of 1901 there was an exonarthex or porch with a colonnade [21, fig. 27][4]. The length of the basilica including the apse and narthex is ca. 39.00 m.; width, ca. 20.80 m.; nave length, 28.00 m. [4, p. 56, 59; 22, p. 160-181; 24, p. 39-41; 23, p. 332, fig. 3, for the excavation plan of 1963 used to determine most proportions; 32, p. 101-103, fig. 29][5]. The basilica including the exonarthex or porch is proportioned 1:2 (o.c./ext.); nave, aisles and narthex together, 2:3 (ext./cl.) nave, aisles and apse together, 2:3 (ext./cl.) nave and apse together, 1:3 (ext.); width of the nave and that of the basilica, 1:2 (cl.); width of the north aisle and that of the nave, 1:2 (o.c.)[6]; narthex, 1:4 (o.c./cl.).

Church No. 36, the **"East Basilica"** (Fig. 5) is located at the end of a major street at the northeast edge of Chersonesos, on the brink of a bluff 12 meters above the sea; it replaced an Antique temenos, probably the sanctuary of Parthenos [33, p. 171-174]. The basilica was first excavated on the initiative of the Odessa Society of History and Antiquities in 1876; additional investigations were carried out in 1908 by R. Leper, in 1974 by S. G. Ryzhov and in 1975-1976 by M. I. Zolotarev [5, p. 165; 34, p. 162-63]. No archaeological evidence which would date the building was found but coins of Maurice (582-602) probably date one of the earliest repairs; also, fragments of amphorae and red slip ware of the end of the 6th - first quarter of the 7th century, together with mosaic tesserae were found in a well in front of the basilica [35, p. 12-19;

[4] The exonarthex does not appear in most other floor plans of the church.

[5] The plan of the basilica in the latter publication is shorter and does not conform to the measurements in the text [32, p. 101-103, fig. 29].

[6] The south aisle is narrower at the east end.

34, p. 162-63; 11, p. 75-76, fig. 18-1, 23; 36, p. 78-79; 10, p. 878]. Thus the basilica was erected before the late 6th century. Some scholars attributed it to end of the 5th or first half of the 6th century [5, c. 164, fig. 72; 30, p. 385, fig. 1-d (titled "Basilica in Uvarov Street 22"); 15, p. 68-69].

The East Basilica is poorly preserved and parts of the apse were washed into the sea. The church is somewhat smaller than the West Basilica: length including the reconstructed apse and two narthexes was ca. 36.00 m.; width, ca. 18.20 m.; nave length 20.50 m. [21, p. 44; 5, fig. 72, for the excavation plan of 1908 used to determine most proportions; 37, p. 161-162, fig. 50, is not exact and does not conform with the dimensions of the text]. The stylobates are not straight and the nave dimensions differ depending upon where they are measured; nevertheless each proportion fits the published excavation plan rather well except that of the nave. The basilica including the exonarthex is proportioned 1:2 (o.c.); nave, aisles and apse together, 2:3 (o.c.); nave, aisles and narthex together, 2:3 (o.c./cl.); nave, 1:2 (ext./cl.); width of the nave and that of the basilica, 1:2 (cl./ext.); width of one aisle and that of the nave, ca. 1:3 (cl.); narthex, 1:3 (o.c./cl.); width of the narthex and that of the nave, 1:2 (cl.); inner and outer narthexes together, 1:2 (o.c.); width of the exonarthex and that of the narthex, 1:2 (cl.). In contrast to the two previous examples the nave has the short, broad proportion 1:2. All major dimensions of the floor plan are coordinated by proportions composed of the ratios 1:2, 1:3 and 2:3.

Medium sized **"Basilica 1935"** (Fig. 6), prominently located on the northern coastline was first excavated by G. Belov in 1935. Excavation continued in 1949-1954 and 1957 by G. Belov, in 1950 by S. Strzheletskiy and in 1956-1957 by E. Zherebtsov [38; 39, p. 205-13, fig. 1, for an excavation plan in several phases used to determine the proportions; 40, p. 94-104, fig. 2; 41, p. 61-66]. It was erected no earlier than the middle or second half of the 6th century: a terminus post quem is provided by coins of Justinian I, amphorae and red slip ware fragments in archaeological strata underneath the basilica, in well B and by cisterns for salting fish which were filled up when the basilica was constructed [36, p. 80-81; 27, p. 111-13; 41, p. 65]. Other scholars have proposed dates in the first half or middle of the 6th century (or the period of Justinian I) primarily based upon the style of the marble capitals [38, p. 113; 5, p. 178, fig. 86; 30, p. 385, fig. 1-b, (incorrectly titled West Basilica); 15, p. 52-55, fig. 4-6]. A date no earlier than the mid-7th century has also been proposed based upon a coin probably of Constans II (641-668) from a cistern which, however, is located at a considerable distance from Basilica 1935 [11, p. 73, 77, fig. 18-8; 42, p. 125].

Basilica 1935 has similar dimensions to those of the East Basilica and also has an exonarthex. The length including the exonarthex is ca. 37.00-38.00 m.; width, ca. 18.50 m.; nave length, 20.80 m. The proportions are also similar. The basilica including the exonarthex is proportioned 1:2 (ext.); basilica without the apse and exonarthex, 2:3 (cl.); basilica without the narthex and exonarthex, 2:3 (ext.); nave, 1:2 (ext./o.c.); width of the nave and that of the basilica, 1:2 (cl./ext.); width of one aisle and that of the nave, 1:3 (cl.);

narthex, 1:4 (cl.); width of the narthex and that of the nave, 1:2 (o.c./cl.); central narthex unit, 1:2 (o.c./cl.); narthex and exonarthex together, 1:2 (cl./o.c.). All major dimensions of the floor plan are thus coordinated by the proportions 1:2, 1:3, 1:4 and 2:3.

Basilica 1935 was constructed over the remains of a somewhat earlier building of the end of the 4th – third quarter of the 5th centuries; it was probably a synagogue [26, p. 84] with a floor plan somewhat similar to that of Christian basilicas, but without colonnades. This building, including the apse (which stands askew) but without the reconstructed narthex is proportioned 2:3 (cl.), the same proportion employed in the later Christian basilica. Probably in the 11th-12th century period a much smaller basilica was erected in the western part of the nave of Basilica 1935; its nave was proportioned 1:2 (cl.). Similar, if not equally comprehensive numeric proportions therefore coordinated the dimensions of three buildings on the site during a period of as much as seven or eight centuries.

Church No. 14, known as the **"Basilica on the Hill"** was one of the largest basilicas of Crimea (Fig. 7); it is situated in the northwestern part of Chersonesos at the highest point of the city. Basilica 14-A, probably of the 11th century was excavated in 1890 by K. K. Kostsyushko-Valyuzhinich; Early Byzantine Basilica 14-B was excavated in 1973-1977 under the direction of S. A. Belyaev and excavation continued until 1983, but unfortunately the results were inadequately documented. Basilica B was built no earlier than the second quarter of the 6th century: a terminus post quem is based upon amphora fragments, red slip ware and coins of Justinian I from a well which was filled before the construction of the basilica [23, p. 336-337; 36, p. 82; 7, p. 223-224; 11, p. 85-86, fig. 18-4; 28, p. 106-116]. Some scholars have dated Basilica B to the 4th century without evidence [43, p. 125-126], or considerably later than the 4th c. because of its architectural and decorative features [15, p. 58-60, fig. 9].

The dimensions of Church No. 14 (B) are surpassed only by those of the Uvarov Basilica and (slightly) by the West Basilica: length, ca. 38.00 m.; width, ca. 22.50 m.; nave length, ca. 25.50 m. Unfortunately, Basilica B is very poorly preserved and the schematic plan published by S. A. Belyaev is inadequate for the identification of proportions [43, fig. 1]. A recent reconstructed floor plan [44, p. 111-114, fig. 33] based upon the scant excavated remains is partly hypothetical but nevertheless implies that the early phase of the Basilica on the Hill was erected employing, for the most part, numeric proportions comparable with those of other basilicas of Chersonesos. If the reconstructed floor plan is correct the basilica without the apse is proportioned 2:3 (o.c.); the basilica without the narthex, 2:3 (cl.); nave, 1:2 (ext./cl.); width of the nave and that of the basilica, 1:2 (cl./o.c.); width of one aisle and that of the nave, 1:3 (cl.); narthex, 1:4 (o.c.); width of the narthex and that of the nave, 1:2 (ext.).

Smaller but not necessarily unimportant Christian basilicas were also constructed in Chersonesos employing similar numeric proportions. One of them, located less prominently in a residential quarter is **Church No. 15**, called the **"Basilica in a Basilica"** (Fig. 8). It was excavated down to the level of its mosaic floors in 1889 and 1890

by K. K. Kostsyushko-Valyuzhinich; excavation under the floors was carried out in 1972-1975 by S. G. Ryzhov [45, p. 14-15; 46, p. 32; 47, p. 290-99, fig. 1-2, for a floor plan which was probably distorted during publication; 48, fig. 1, for the excavation plan of 1973 used to identify most proportions; 5, p. 172, 175, fig. 82, with plans which are not as reliable]. Basilica No. 15 was erected in the 6th century probably during the reigns of Justinian I (527-565) or Justin II (565-578): a coin with a monogram of Justinian I or Justin II was found under the north aisle mosaic floor [48, p. 3, 26; 36, p. 82]. Some scholars have dated the basilica to the 6th century [5, p. 172-175; 47, p. 294; 49, p. 55-56; 13, p. 49; 12, p. 282; 11, p. 73-76, fig. 22; 50, p. 123] or to the late 5th or early 6th century based primarily upon carved ornamentation [15, p. 60-65, fig. 10-13].

Although the area west of the narthex was not excavated it is unlikely that Basilica No. 15 had an exonarthex. The basilica length is ca. 27.00 m; width, ca. 18.50 m.; nave length, ca. 17.50 m. The walls stand slightly askew and the basilica is somewhat wider at its east end. The basilica is proportioned 2:3 (cl.); nave and aisles together, 1:1 (o.c./cl.); nave, 1:2 (cl.); width of the nave and that of the basilica, 1:2 (cl./o.c.); width of one aisle and that of the nave, 1:3 (cl.); narthex, 1:4 (o.c.); width of the narthex and that of the nave, 1:2 (ext./cl.); corner bays of the narthex, 1:1 (cl.). Thus all major dimensions of the floor plan were coordinated by the proportions 1:1, 1:2, 1:3 and 2:3.

The floor plan of the much smaller medieval aisled basilica built into the ruins of the Basilica in a Basilica probably in the 11th century was also numerically proportioned, if somewhat less comprehensively. Nave, aisles and narthex together are proportioned 2:3 (ext.); nave, aisles and apse together, 2:3 (ext.); nave and aisles together, 1:1 (ext./cl.); nave, 1:2 (ext.); nave and apse together, 1:3 (cl./o.c.); narthex, 1:3 (cl.). These proportions appear to have been inspired by those of the earlier basilica: perhaps the builders of the medieval basilica were familiar with the application of numeric proportions and studied the floor plan of the earlier building.

Church No. 22, known as the **"North Basilica"** is among the smaller basilicas of Chersonesos; it is located on the northern coastline between the Uvarov Basilica and Basilica 1935 (Fig. 9). First excavated in 1893 by K. K. Kostsyushko-Valyuzhinich, additional investigations were carried out in 1981 by S. G. Ryzhov [51, p. 53-56; 21, p. 27-29, fig. 22; 5, p. 168, fig. 75; 30, fig. 1-c (erroneously titled Basilica 1935); 52; 53, p. 67; 15, p. 51, fig. 3; 11, p. 73, 76, fig. 23-3; 54, p. 145-147, fig. 43]. In the absence of archaeological evidence scholars have dated the basilica to the 6th century by analogy with other Chersonesos basilicas. Northern portions of the basilica were washed into the sea but the floor plan has been reconstructed based upon symmetry and the dimensions of the earlier excavation plans, for instance the excavation plan of 1893 by M. I. Skubetov [published in: 21, fig. 22] and the plan of 1893 with the addition of a narthex [published in: 5, fig. 75, used to determine the proportions]. No plan of the excavation of 1981 was published [52, fig. 2].

The length of Church No. 22 was ca. 25.00 m.; width, ca. 19.00 m.; nave length, ca. 16.00 m. An evaluation of the available floor plans implies that the nave, aisles

and apse together are probably proportioned 2:3 (ext./cl.); nave, aisles and narthex together, 2:3 (ext./cl.); nave and aisles together, 1:1 (cl./ext.); nave, 1:2 (cl./ext.); width of the nave and that of the basilica, 1:2 (cl.); width of one aisle and that of the nave, 1:2 (ext.); narthex, 1:4 (ext./o.c.); width of the narthex and that of the nave, 1:3 (cl.). All major dimensions of the basilica were thus apparently coordinated by the proportions 1:1, 1:2, 1:3, 1:4 and 2:3.

Some basilicas of Chersonesos were very poorly preserved but are presented here because an evaluation of the remains and the available evidence implies that they were erected employing numeric proportions similar to those of the better preserved basilicas reviewed above. **Church No. 28**, for instance, one of the smaller basilicas of Chersonesos stood on the main square (Antique agora) in the center of the city together with five other churches with different floor plans (Fig. 10). Basilica No. 28 and some of the other churches were first excavated in 1861; additional investigations were carried out in 1890-1892 and 1896 [55, p. 14-15; 56, p. 172-173; 21, p. 61-63, fig. 43, 44]. When a new Cathedral was erected on the square in the 1870s-1890s the aisles and narthex of Basilica No. 28, as well as other nearby churches were completely destroyed [21, p. 61; 5, p. 169, n. 2]. Basilica No. 28 was partially reconstructed on the site after ca. 2000[7]. In the absence of firm archaeological evidence the basilica is dated by some scholars to the 6th century by analogy with other Chersonesos basilicas [5, p. 168-72, fig. 79; 11, p. 77-78, fig. 20; 57, p. 83-84] or, based upon the style of the capitals, to the first half of the 6th century [15, p. 65-67, fig. 14-15].

The length of the basilica was ca. 26.00-27.00 m.; width, ca. 16.00-17.00 m.; nave length, ca. 16.00 m. D. Ainalov published excavation plans of 1861 (fig. 44) and 1890-1891 (fig. 43), but as he noted the plan of 1890-1891 has an inexact scale [21, p. 61, n. 1]; the plan of some of the churches on the main square published by A. Jacobson based upon the plan of 1861 also has an inexact scale [5, fig. 79]. A recent reconstruction plan attempts to reconcile the previous plans [58, p. 172, fig. 55]. According to the first excavation plan of 1861, which appears to be the most accurate, the basilica was proportioned 2:3 (ext./cl.); nave and aisles together, 1:1 (ext./o.c.); nave, which was preserved better than the exterior walls, 1:2 (cl.); width of the nave and that of the basilica, 1:2 (cl.); width of one aisle and that of the nave, 1:3 (cl./o.c.); narthex, 1:4 (o.c.); width of the narthex and that of the nave, 1:2 (ext.). As reconstructed the proportions of Church No. 28 are similar to those of the Basilica in a Basilica with the exception of the narthex; the proportions 1:1, 1:2, 1:3, 1:4 and 2:3 coordinate all major dimensions of the church.

Basilica 1932, located on the north coast near Basilica 1935 is also poorly preserved (Fig. 11). Its dimensions and proportions are very similar to those of Church No. 28. It

[7] As in some of the other basilicas of Crimea (Basilica Nos. 7, 22, 23, 36 and Partenit) the wall over the stylobate, here reconstructed on the site and shown in some floor plans, is a medieval addition.

was first excavated down to floor level in 1932 by G. D. Belov; additional excavation was carried out in 1967 under the floors in the apse and nave, in 1978 under the mosaic floor of the south aisle and in 1979 in the north aisle [59, p. 202-267; 60, p. 8-9, 14-19; 61, p. 3-4; 62, p. 6-13]. Basilica 1932 was probably built no earlier than the middle or second half of the 6th century: a terminus post quem is provided by archaeological evidence from well B and a cistern which was filled when the basilica was constructed [63, p. 316-322; 36, p. 81-82; 64, p. 57-60]. The basilica has been attributed to the 6th century or the beginning of the 7th by analogy with other Chersonesos basilicas [59, p. 232; 5, p. 176-177; 7, p. 227] and to the beginning of the 6th century based upon architectural ornamentation and misunderstood stratigraphic data [15, p. 55-56].

The length of Basilica 1932 is ca. 26.00 m.; width, ca. 16.50 m.; nave length, ca. 16.00 m. measured on the major axis, since the apse and east wall stand askew [5, p. 175-176, fig. 84]. It is apparently proportioned 2:3 (ext.); nave and aisles together, 1:1 (ext.); nave, 1:2 (cl./ext.); width of the nave and that of the basilica, 1:2 (cl./ext.); width of one aisle and that of the nave, ca. 1:3 (cl.); narthex, 1:4 (o.c.); width of the narthex and that of the nave, 1:2 (ext./cl.); central unit of the narthex, 1:2 (ext./cl.). Its major dimensions were thus apparently coordinated by the proportions 1:1, 1:2, 1:3, 1:4 and 2:3.

Church No. 7, usually known as the **"Kruze Basilica"**[8] is the smallest known Early Christian basilica of Chersonesos; it is located at the crossing of two streets near the southeast edge of the city (Fig. 12). The first official, documented excavation was carried out in 1891 by K. K. Kostsyushko-Valyuzhinich [65, p. 10-11; 21, p. 67-70; 5, p. 188-190, fig. 91; 11, p. 74, 78, 82, fig. 21-2]. The Austrian-Ukrainian expedition of 1998 continued excavation [66, p. 229-247] and in 2005 archaeological investigations were renewed [67, p. 198-212]. The basilica was probably built during the reign of Justinian I. The date is based upon archaeological finds including coins of Justinian I from a cistern in front of the basilica entrance which was filled when the basilica was built [67, p. 208-209]. Some scholars have attributed the church to ca. 500 [15, p. 69-70, fig. 17-18], and to the 5th century based upon its triconch sanctuary [5, p. 188-190] but basilicas with comparable triconch sanctuaries were also constructed in the 6th century [68, p. 266-268].

The Kruze Basilica is unusual because of its triconch sanctuary with unequally sized, somewhat smaller flanking exedras[9]. The outer walls of the church are extremely thick, ranging between ca. 1.20 and 1.30 m., much greater than wall thicknesses of much larger basilicas, which often range between ca. 0.70 and 1.00 m. The great wall thickness could be explained by assuming that the church was partially vaulted (aisles,

[8] The basilica is named after Naval Officer Karl Kruze because it is assumed, without adequate substantiation, that he initially excavated it in 1827 [21, p. 51, 69; 66, p. 230-232].

[9] A small church with a triconch sanctuary which has been lost once stood next to the Uvarov Basilica [70, p. 59-61, fig. 86].

apse and narthex) but also by the fact that the church was built on fill above a slope [66, p. 237; 67, p. 202]; similar wall thicknesses of 1.20-1.30 m. were employed in the construction of the Basilica on the Hill, which also stands on a slope [43, p. 116-117]. Graves which may be roughly contemporary with the church were found in the narthex [69, p. 290-306].

The length of the Kruze Basilica is 24.40 m.; width, 17.70 m.; nave length, ca. 10.70 m. [67, p. 204]. The basilica is apparently proportioned 2:3 (cl./o.c.); nave, aisles and narthex together, ca. 1:1 (o.c./ext.); nave, aisles and apse together, ca. 1:1 (ext./cl.); nave and apse together, ca. 1:2 (o.c./cl.); width of the nave and that of the basilica, 1:2 (cl.); width of one aisle and that of the nave, 1:3 (cl.); narthex, 1:4 (ext./o.c.); radius of the south exedra and that of the central exedra, 1:2 (cl.). Thus the proportions, 1:1, 1:2, 1:3, 1:4 and 2:3 coordinate all major dimensions of the building.

Our understanding of the proportions of early basilicas in Crimea can be expanded by considering churches beyond Chersonesos. The remains of three basilicas were studied in Southwest Crimea. In Early Byzantine times the Dory region, inhabited by Alans and Goths was located in the mountains and on the south coast between the mouth of the Chernaya River on the outskirts of Sevastopol and Aluston (now Alushta), a fortress built during the reign of Justinian I. Dory was under the political and cultural influence of Cherson and its local Christian communities were subordinate to the Bishop of Cherson until the formation of a Diocese of Gothia [71, p. 615-626]. The fortress of Doros, located on Mangup Kale, a vast mesa-like plateau about 24 km. east of Cherson was the political centre of this region.

The largest known basilica of the Dory region, probably the Church St. Constantine and Helena was located near the center of **Mangup Kale** (Fig. 13). It was excavated in 1890 by F. A. Braun, in 1912-1914 by R. Leper and in 1938 by M. Tikhanova; intermittent excavations which were not adequately published continued from the end of the 1960s until the present [72, p. 18-19; 73, p. 76-77, 146-149; 74, p. 334-389; 75, p. 304-307; 76, p. 30-40; 77, p. 307-318]. Based upon similarities to the Chersonesos basilicas and upon the style of its marble carving most scholars dated the building to the period of Justinian I [78, p. 73; 74, p. 387; 79, p. 205-216, fig. 1; 5, p. 195, fig. 99, 1]. However, it was probably erected no earlier than the second half of the 6th century, the period when the Byzantine fortress on the plateau was constructed [26, p. 114; 29, p. 104; 80, p. 387]. Other proposed dates and sequences remain unsubstantiated and lack evidence [81, p. 3-4; 77, p. 315-316]. The basilica was probably in use until the end of the 15th or 16th century and was rebuilt repeatedly but its original floor plan was similar to that of the basilicas of Chersonesos [79, p. 212-214; 74, p. 336]: it had a nave, two aisles, a projecting single apse, narthex, as well as two outer side aisles which flank the basilica on both sides [79, p. 205-216, fig. 1; 30, p. 386-393, fig. 3a; 82, fig. 1]. The Uvarov Basilica, Basilica on the Hill and West Basilica had single outer side aisles which flanked the south aisle, and these outer side aisles could, but need not necessarily have been contemporary with the basilicas. The apse differed from most in

Chersonesos only because it was three-sided on the outside. A small apse was added to the east end of the south aisle no earlier the 10th century [83, p. 296].

The length of the basilica at Mangup Kale is ca. 31.50 m.; width without the outer side aisles, ca. 19.00 m.; nave length, 20.00 m. [79, p. 207, fig. 1; 82, fig. 1, for the floor plan in which the proportions were determined]. The basilica including the outer side aisles, without the apse, is proportioned 1:1 (cl.); the basilica without the outer aisles, 2:3 (ext./cl.); nave, aisles and narthex together, 2:3 (cl./o.c.); nave, aisles and apse together, 2:3 (cl./ext.), nave, 1:2 (ext./cl.); width of the nave and that of the basilica, 1:2 (o.c.); nave and apse together, 1:3 (cl./o.c.); width of one aisle and that of the nave, 1:2 (o.c.); narthex, 1:3 (ext./o.c.); width of the narthex and that of the nave, ca. 1:2 (cl.). Thus all major dimensions were coordinated by the proportions 1:1, 1:2, 1:3 and 2:3.

A small basilica was located in the center of **Eski Kermen**, a mesa-like plateau in forested hills about 20 km. east of Chersonesos (Fig. 14). A Byzantine fortress was built there at the end of the 6th century which was transformed into a medieval city, inhabited until the end of the 13th century [84, p. 43-49; 29, p. 104; 85, p. 129-150]. The remains of the basilica were known as early as the 16th century but the first excavations were carried out in 1930 [86, p. 25-29; 87, p. 213-253; 79, p. 217-219]. Additional investigations and excavations behind the north wall took place in 1979-1980 under E. Parshina [88, p. 36-59; 89, p. 99-113]. Probably the basilica was built at the same time as the fortress at the end of the 6th century [84, p. 45; 85, p. 136-137] but some scholars have attributed it to the 5th or 6th century because of similarities with the basilicas of Chersonesos [79, p. 219; 5, p. 195-196; 30, p. 393, fig. 3-b], or to the 8th century based upon erroneous attributions of the Chersonesos basilicas to the 8th-10th c. period [88, p. 50].

Originally the floor plan of the basilica at Eski Kermen was probably similar to those of the basilicas of Chersonesos but in the 11th-12th century period the east end was rebuilt with three somewhat elongated apses [88, p. 50, fig. 1; 89, p. 108]. Its floor plan has been restored with column locations adjusted to a hypothetical grid [88, p. 50, fig. 10-13; 89, pl. I] but some of the proportions identified in the excavation plan [88, fig. 1] do not fit the restorated floor plan. The length of the basilica is ca. 24.00 m.; width, 13.00 m.; nave length, ca. 12.50-13.00 m. [89, p. 104]. In its later state the nave, aisles and major apse together are proportioned 2:3 (cl.); nave and aisles together, 1:1 (o.c./cl.); nave (up to the major apse), 1:3 (cl.); width of the nave and that of the basilica, 1:2 (ext./cl.); length (e.-w.) of the sanctuary bay and length of the nave, 1:3 (cl.); narthex, 1:3 (o.c.). The continuity in the application of numeric proportions over several centuries which was observed, for instance, in Basilica 1935 and the Basilica in a Basilica is underlined when evaluating the proportions of the basilica at Eski Kermen since the proportions include architectural components added during the medieval period. Nevertheless, most of these proportions could have been present already in the original basilica.

A small basilica is located at the foot of Ayu Dag mountain on the outskirts of **Partenit**, on the coast about 140 km (measured along the coastline) east of Chersonesos (Fig. 15). The basilica was first excavated in 1871 by an artist, D. M. Strukov. New excavations took place in 1907 under the archaeologist N. I. Repnikov [90, p. 37-39; 91, p. 91-140] and additional investigations of some parts of the basilica and adjacent monastic structures in 1998-2001 [92, p. 21-24; 93, p. 35-41; 94, p. 6-8]. Partenit basilica was apparently part of the Monastery of the Apostles, connected with St. John, Bishop of Gothia in the second half of the 8th century.

The report published by N. Repnikov [91, p. 91-140] contains the most detailed description of the monument, much of which is now under the earth. His fig. 8 provides a detailed excavation plan in which the original basilica, later reconstructions, additions and the proportions were identified. The original basilica probably had a nave, two aisles, a single projecting apse and narthex. The aisles were separated from the nave either by marble columns, or more probably by piers, since the piers were constructed of the same material as the walls, Inkerman ashlar [91, p. 99, fig. 8]. A number of columns and capitals appear to have been brought to the site from Chersonesos; however, they may not actually have been used in the original basilica, perhaps because of a change in plans during construction [95, p. 304-307]. Probably builders from Chersonesos took part in the construction of the basilica at Partenit because the Inkerman ashlar blocks were brought from the vicinity of Chersonesos and the basilica is similar to those of Chersonesos. Usually the original basilica is dated to the second half of the 8th century [91, p. 97; 96 , p. 49-50; 30, p. 402, fig. 8; 26, p. 208-209; 29, p. 196] but it could have been built in the 7th or beginning of the 8th century when Partenit probably appeared as a Market Town [95, p. 299-313]. Alternatively, based upon excavations of 1998-2001 which are not completely published it may have been constructed no earlier than the end of the 9th – beginning of the 10th centuries [93, p. 41; 94, p. 6-7].

Among the numerous later changes to the original basilica are: the addition of apses to the side aisles; separation of the side aisles from the nave by walls between piers; cross walls in the side aisles; the almost complete reconstruction of the exterior walls. One of the rearrangements of the basilica, probably dated to the 9th-10th centuries based upon archaeological evidence, resulted in the isolation of the eastern parts of the aisles, which were furnished with apses. According to an epigraphic source of 1427 the church was restored by Damian, Metropolitan of Gothia in that year. Probably in the 16th century a small church was built into the eastern part of the nave [95, p. 299-315, with bibliography].

According to the plan published by N. Repnikov the length of the basilica is ca. 17.20 m.; width, 11.80 m.; nave length, almost 9.90 m. The basilica is proportioned 2:3 (ext.); nave and aisles together, 1:1 (cl.); nave, 1:2 (o.c./cl.); width of the nave and that of the basilica, 1:2 (ext.); nave and apse together, 1:3 (cl./ext.); width of one aisle and that of the nave, 1:2 (cl.); narthex, 1:3 (o.c.); width of the narthex and that of the nave,

1:2 (cl./o.c.). Thus all major dimensions are coordinated as comprehensively as those of the basilicas of Chersonesos by the proportions 1:1, 1:2, 1:3 and 2:3.

Only portions of a small basilica were excavated at **Tyritake** (Fig. 16) south of modern Kerch at the east end of Crimea, but the remains are of interest because they provide an insight into proportions applied in the former Kingdom of Bosporus, which was incorporated into the Byzantine Empire under Justinian I [97, p. 202; 26, p. 97]. Tyritake basilica was excavated in 1936-1937 by V. Gaidukevich [97, p. 190-204; 98, p. 67-72]. Some scholars have dated the basilica to the period of Justinian I based upon the historical context [97, p. 199-203; 5, p. 197; 26, p. 97; 29, p. 89] or to the end of the 5th or beginning of the 6th century based upon the style of its marble details [98, c. 95-96]. Parts of the exterior walls, foundation walls, foundations of the stylobates and one column base, but neither the apse nor narthex were found. Most walls stand somewhat askew and the proportions are therefore approximate. The interior width of the basilica is ca. 9.00 m.; nave length, ca. 11.00 m. [97, p. 191, fig. 1]. Nave and aisles together are proportioned ca. 1:1 (ext./cl.); nave, ca. 1:2 (o.c./cl.); width of the nave and that of the basilica, ca. 1:2 (o.c./ext.); width of one aisle and that of the nave, ca. 1:3 (cl.). Thus even though the evidence is scanty, each of the known, approximate proportions of the basilica at Tyritake is comparable with proportions common in basilicas of Chersonesos and the surrounding regions.

3. *Conclusions.*

Currently the remains of 16 early Christian basilicas are known in Crimea, but in this study only 14 basilicas were reviewed.[10] They include the largest, most prominent and best known, as well as small and probably less significant examples. A majority of them are sufficiently well preserved and recorded to evaluate their major floor plan dimensions. The major dimensions of each of these basilicas were coordinated employing numeric proportions and thus the application of numeric proportions must have been well known to architects and builders of early Christian basilicas in Crimea.

The almost complete lack of firm documentary evidence prevents a precise and reliable evaluation of the Christian basilicas of Crimea in terms of chronology, specific church function and patronage. Chronologies have been proposed by some scholars based upon excavated carved architectural ornamentation which was not found in situ. Such dates are not reliable because architectural carving of the 5th-6th century period can only seldom be dated with precision and because in provincial regions such as Crimea carving styles may have persisted long after they originated elsewhere. Moreover, carved members were at times installed or reused during undetermined

[10] The exceptions are Chersonesos Basilica No. 17 and the Bosporus basilica in Kerch. The excavation of Church No. 17 in 1889 remained incomplete; only a schematic plan [45, p. 14; 100, p. 36, pl. III,17; 21, p. 97] but not a detailed floor plan were published. As outlined above the Bosporus basilica under the medieval church of St. John in Kerch was almost completely lost.

periods after their initial production. Multiple use of architectural marble carving was widespread[11].

Nevertheless, many reviewed basilicas have been reasonably attributed to the 6th and early 7th centuries based partly upon archaeological evidence. In Chersonesos one basilica is reasonably interpreted as a cathedral, others as parish and monastic churches and some perhaps had memorial functions. The sizes of the basilicas vary considerably between Church No. 23, the Uvarov Basilica with a nave length of ca. 30.35 m. to quite small basilicas such as Church No. 7, with a nave length of no more than ca. 10.70 m. Some basilicas were located in prominent sites such as the main city square, the end of a major street or high seaside bluffs as landmarks to be seen within the city or from the sea, while others were located in residential quarters where they were seen only locally. Basilicas with numeric proportions were erected in Chersonesos, the major city of the region and at sites which are remote, such as Mangup Kale, Eski Kermen, Partenit and Tyritake. Thus as far as may be judged based upon the existing evidence numeric proportions were employed in the Christian basilicas of Crimea regardless of chronology, specific function, size, importance and location.

Numeric proportions were employed in many variations in Christian basilicas located from the Iberian peninsula to the Caucasus region and from Egypt to France [1, Chapter1]. The reasons for the use of numeric proportions in the examples of Crimea can therefore not be clarified fully by an evaluation of the evidence in Crimea alone: rather, the question, why these proportions were used in Christian basilicas must be explored within a broad scope beyond the goals of the present study [1, Chapters 2-9; 103, p. 1-22].

Nevertheless, a number of observations concerning the numeric proportions employed in the Christian basilicas of Crimea provide important insights. For instance, the reviewed evidence indicates that the numeric proportions employed were composed only of the first three or four numbers. The application of these proportions on site was therefore feasible even if the builders had only a rudimentary education and little understanding of mathematics. In practice the application of the proportions would have required only basic measuring equipment such as cords or rods and simple rules of thumb using numbers which could be counted on the fingers of one hand. We may only speculate whether the architects and builders of Crimea thought of these rules of thumb as "proportions" or of the relationships between the numbers they employed as numeric ratios: perhaps some did.

The floor plan proportions of seven of the 14 reviewed basilicas are composed only of the first three numbers. Other numbers could have been employed in the vertical proportions of the basilicas, and the limitation to the first three numbers could have

[11] For the unreliability of church dates based upon marble details: [101]; for a corpus of the Early Byzantine architectural carving of Chersonesos: [102].

been fortuitous or unintended. But it is also possible that the first three numbers were given priority because of their importance in Christian symbolism.

Early Christian Crimea had strong links with Constantinople, the Balkan east coast and Asia Minor through trade across the Black Sea and these links could have been reflected in the building forms of its Christian basilicas; indeed, several scholars referenced above have emphasized links between the early church architecture of Crimea and that of Constantinople [68, p. 261-279]. A comparison of the proportions of basilicas in Crimea with those of the capital and other Black Sea regions is therefore of interest.

As one example, the floor plan proportions of Church No. 15, the Basilica in a Basilica are almost the same as those of the Church of St. John of the Studius Monastery in Constantinople [104, figs. 12-19, for the most comprehensive published plans; 105, fig. 6, for a partially dimensioned floor plan of 1975; 106, p. 19-27, figs. 5-10, pls. 3-16, for more current illustrations; 107, p. 143-58, for additional bibliography and further illustrations; 108, p. 115, for the date of the church, ca. 453]. The floor plan of St. John's, including the apse and narthex is proportioned 2:3 (ext.); nave and aisles together, 1:1 (o.c./cl.); nave, 1:2 (cl.); width of one aisle and that of the nave, 1:2 (ext./o.c.); narthex, 1:4 (ext./cl.); narthex central unit, 1:2 (o.c.). Many of these proportions also occur in other Christian basilicas of Constantinople and they may therefore be thought of as characteristic of the known basilicas of the capital. For instance, Basilica C at Beyazit (without the apse) is proportioned 2:3; nave and aisles together are proportioned (almost) 1:1 and the nave is proportioned 1:2 in Basilicas A and C at Beyazit. The width of one aisle and that of the nave are proportioned 1:2 in St. John's, but 1:3 in Basilica C at Beyazit [106, p. 68-73, fig. 37; 107, p. 28-33; 109, p. 96-98, fig. 2, for the floor plan in which the proportions were identified; 110, p. 163-167, fig. 1] and in the partially preserved Church of the Virgin Chalkoprateia [111, p. 149-157[12]; 112, p. 587-594, pls. 298, 299, 304], implying that the proportion 1:3 was also common in basilicas of the city. Most major floor plan proportions of the rather well preserved Metropolitan Church at Nessebar (Mesembria) on the Black Sea coast of Bulgaria are similar [113, p. 2-13, figs. 3-10, pls. 1-2, with dimensions; 114, p. 321-346, figs. 1, 2, 13][13]: the basilica including apse and narthex is proportioned 2:3; nave and aisles together, 1:1; nave, 1:2, width of one aisle and that of the nave, 1:2.

These rather short, broad Constantinopolitan proportions are echoed in Crimea not only in Church No. 15 but also in Churches No. 7 (the nave and apse together are proportioned 1:2, even shorter and broader than naves proportioned 1:2), No. 22,

[12] W. Kleiss reconstructs the south aisle with a clear width of 5.80 m. and of the nave with a clear width of 17.20 m., providing the proportion ca. 1:3; however, other parts of his restored floor plan are largely hypothetical because the church remains are insufficiently known.

[13] S. Boyadchiev assumes that the preserved basilica with piers is a reconstruction of an earlier basilica with column supports and dates Phase I to the 5th century.

No. 28, Basilica 1932, the basilica at Tyritake and the medieval basilica inside Church No. 15; in each (except Tyritake) the proportion of the church, at times without the apse or without the narthex is 2:3; in most the proportion of the nave is 1:2; in five the proportion of the nave and aisles together is 1:1. The nave is proportioned 1:2 in five other basilicas of Crimea: Churches No. 14, No. 36, Basilica 1935 and the basilicas at Mangup Kale and Partenit.

In other basilicas of Crimea elongated proportions were employed which are similar not to those common in Constantinople but rather, to those of some of the basilicas of Asia Minor. Church EA at Sardis [103, p. 20-24, Table 3; 115, p. 300-302, fig. 10; 116] and a number of other basilicas of Asia Minor [103, p. 6-7] were erected with the basilica, including apse and narthex proportioned 1:2, nave and aisles together, 2:3 and the nave, 1:3. In Crimea Churches No. 13, 36 and Basilica 1935 are proportioned 1:2 as is Church No. 23 without the apse and outer narthex; nave and aisles together are proportioned 2:3 in Church No. 23. The nave is proportioned 1:3 in the basilica at Eski Kermen and nave and apse together 1:3 in Churches No. 13 and No. 23, Mangup Kale and Partenit.

Thus some architects and builders of Christian basilicas in Crimea could have been influenced by construction practices of Constantinople, the east coast of Bulgaria and Asia Minor in their use of numeric proportions. Certainly the proportions common in Constantinople are more prevalent. Of course a strong impact of these practices is probable only in those churches which follow the examples of the capital, Mesembria or Asia Minor rather closely such as Church No. 15 and, to a lesser degree Church No. 23.

But the numeric proportions of basilicas in Crimea cannot simply be divided into two groups or categories each of which reflects, more or less extensively, the one or the other distant "model". For instance, the entire floor plan of Church No. 36 is proportioned 1:2 as is common in Asia Minor, but its nave is proportioned 1:2 as is common in Constantinople. Similarly the entire basilica at Partenit is proportioned 2:3 and the nave 1:2, proportions common in the capital, but nave and aisles together are proportioned 2:3 as in many basilicas of Asia Minor. At Eski Kermen nave, aisles and major apse together are proportioned 2:3 and nave and aisles together, 1:1, reminiscent of Constantinopolitan practice, but the nave is proportioned 1:3 as is more common in Asia Minor.

Moreover, the nave proportion 1:2 could at times have been chosen for functional or aesthetic reasons: in a nave proportioned 1:2 more worshippers are closer to the chancel or to a solea than in a nave with the same capacity proportioned 1:3, and in very small basilicas a nave proportioned 1:3 may be too narrow in appearance or too narrow to function properly. A nave proportioned 1:2 appears to be more harmonious but less dynamic than one proportioned 1:3. Be that as it may, the prevalent proportion of the nave in basilicas of Crimea was clearly 1:2 (10 of 14 examples). While the nave and apse together are proportioned 1:3 in four basilicas, only the nave of the basilica at Eski Kermen is proportioned 1:3, and that proportion could have been determined

when the three apses were constructed in the medieval period. The prevalence of naves proportioned 1:2 in Christian basilicas of Crimea is unusual since in many regions, for instance Asia Minor, Armenia, Syria and Jordan naves proportioned 1:2 are rare or even unknown.

Functional reasons could have been responsible for dimensioning the width of the side aisle and that of the nave. When the width of one aisle and that of the nave is proportioned 1:3 rather than 1:2 relatively more worshippers are located in the nave than in the side aisles and can therefore observe the ceremonies without the hindrance of the colonnades. Without considering the interior furnishings and disregarding the question, who occupied the side aisles (men, women or cathechumen?) if the width of the side aisle and that of the nave is proportioned 1:2 half the worshippers will be located in the nave, while if the proportion is 1:3 two thirds of them will be located in the nave. The width of the side aisle and that of the nave was proportioned 1:3 in nine of the 14 reviewed basilicas of Crimea, again an unusual prevalence since the proportion 1:3 was employed only seldom if at all in many other regions. The width of one aisle and that of the nave was proportioned 1:3 in Churches No. 15 and No. 23, the first with the relatively short, broad proportions of Constantinople and the latter with the elongated proportions prevalent in Asia Minor, clearly confirming that the basilicas of Crimea cannot be neatly categorized by supposed influences.

Similarly the prevalent proportion of the narthex in the basilicas of Crimea is 1:4 (7 of 14 examples), a proportion employed in the narthex of St. John's in Constantinople and in that of Church EA at Sardis. Indeed, narthex proportions in Crimea were apparently chosen not (or not only) because of distant models or workshop rules of thumb, but also because of functional demands. Since the length of the narthex was usually determined by the width of the basilica, a narthex proportioned 1:4 (for instance, Church No. 13) provided relatively less space than a narthex proportioned 1:3 (for instance, Partenit), and a narthex proportioned 1:2 (Church No. 23) provided more space than a narthex with the same length proportioned 1:3 or 1:4. Indeed, Church No. 23 is a case in point: since it is the largest known basilica of Crimea if its narthex had been proportioned 1:4 it would have been the largest narthex of the region; but with the decision to employ the proportion 1:2 the capacity of the narthex was doubled, implying that it was important to the builders (and patrons) to contain as many worshippers as possible in the narthex. Thus the proportion of the narthex was apparently at times adjusted to the anticipated number of worshippers who would congregate there; that number, in turn, apparently differed if the basilica functioned as a cathedral or as a memorial, parish or monastic church.

Whether the proposed functional reasons for the proportions of the nave, narthex and width of the aisles were requested by the clergy, perhaps in response to specific local or changing needs is of great interest, but that question can be answered only by further investigation beyond the goals of the present study.

Some quite common proportions of the Christian basilicas of Crimea appear to

have been based not upon any of the proposed reasons outlined above but simply upon rules of thumb. For instance the width of the nave and that of the basilica is 1:2 in each of the reviewed basilicas and the width of the narthex and that of the nave is 1:2 in 8 of the 14 reviewed examples.

The dimensions and proportions of the East Basilica and Basilica 1935 are quite similar to each other as are those of Church No. 28 and Basilica 1932. Even though three of these buildings are poorly preserved and some dimensions are approximate, in each pair probably the same work crews were responsible for the construction of both basilicas during roughly the same periods. The similarities may probably be explained by continuity in workshop practices as well as by similar spacial and financial requirements.

Still, even though the floor plans of the Christian basilicas of Crimea are very similar and many of the proportions are also quite similar, the proportions of most basilicas differ at least somewhat: for the most part the proportions were not applied as templates, or normative formulas as they appear to have been in some basilicas, for instance, of Asia Minor and Jordan. Rather, in Crimea within somewhat limited parameters numeric proportions appear usually to have been tailored specifically to each basilica. In each basilica the choice of numeric proportions was probably based upon reasons which are quite complex. In most basilicas the application of proportions probably did not depend directly upon an impetus from outside the region, but rather upon preexisting site conditions, the size, importance and special function of the basilica, symbolic references, traditional rules of thumb, well known local ongoing construction procedures and perhaps at times personal preferences of the architect, the builders, the clergy or the patrons.

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Бухвальд Г., Завадская И.

Ранние христианские базилики в Крыму и их числовые пропорции

Резюме

Данная статья является измененной и расширенной выдержкой из более масштабного исследования, посвященного изучению пропорций христианских базилик большинства регионов Средиземноморского и Черноморского бассейнов и Кавказа с IV по VII столетия [1]. Оно сосредоточено на числовых, а не геометрических пропорциях, которые, возможно, также использовались в некоторых объектах, но до сих пор не исследовались. Числовые пропорции состоят из отношений целых чисел, в то время как геометрические пропорции построены на геометрических конфигурациях, таких как квадраты или круги и их производных. Цель этой статьи состоит в том, чтобы определить, в каких пределах использовались числовые пропорции в христианских базиликах Крыма, какие специфические пропорции здесь применялись; а также попытаться объяснить, почему те или иные пропорции могли быть выбраны строителями.

В статье определены числовые пропорции 14 базилик Крыма: из них 10 базилик Херсонеса, по одной базилике на плато Мангуп-Кале и Эски-Кермен в Юго-Западном Крыму, в Партените, на южном побережье и в Тиритаке, на восточной оконечности Крыма. Большинство изученных базилик датируются VI – началом VII вв., главным образом, на основании археологических свидетельств.

Большинство размеров каждой из этих базилик и некоторых более поздних базилик, построенных на руинах ранних (например, Базилики в базилике), были скоординированы с использованием числовых пропорций, которые, следовательно, были хорошо известны архитекторам и строителям ранних христианских базилик Крыма. Исходя из имеющихся данных, числовые пропорции применялись в крымских базиликах независимо от хронологии, специфических функций, размера, важности и местоположения. Они были составлены, как правило, из первых трех или четырех чисел. Поэтому использование этих пропорций на месте было вполне реальным, даже если строители имели лишь начальное образование.

Пропорции базилик Крыма сходны с пропорциями базилик Константинополя, Малой Азии и восточной части Балкан. Таким образом, некоторые архитекторы и строители христианских церквей в Крыму использовали числовые пропорции, возможно, под влиянием строительных методов этих регионов.

Тем не менее, числовые пропорции крымских базилик не могут быть просто раз-

делены на группы или категории, каждая из которых отражает ту или иную отдаленную «модель». Многие церкви объединяли «столичные» и «малоазийские» пропорции. Кроме того, иногда на выбор пропорций могли влиять функциональные или эстетические факторы.

Хотя планы христианских базилик Крыма очень похожи и многие из пропорций также сходны, пропорции большинства базилик, по крайней мере, в какой-то степени отличаются. Из этого следует вывод, что по большей части пропорции не применялись как нормативные формулы, шаблоны. При строительстве каждой базилики выбор числовых пропорций определялся комплексом причин. В большинстве базилик применение пропорций, вероятно, не зависело напрямую от внешнего импульса, а скорее, от существующих местных условий, размера, важности и специальных функций базилики, символических связей, традиционных практических правил, хорошо известных местных многовековых строительных методов и, возможно, иногда от личного предпочтения архитектора, строителей, духовенства или патронов.

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Ранні християнські базиліки у Криму та їх числові пропорції

Резюме

Ціль даної статті полягає у визначенні ступеню поширення використання числових (на відміну від геометричних) пропорцій у християнських базиліках Криму, а також у тому, щоб виявити специфічні числові пропорції, які тут застосовувалися; крім того, спробувати пояснити, чому ті чи інші пропорції могли бути обрані будівниками. Були визначені числові пропорції 14 базилік Криму: серед них 10 у Херсонесі, по одній на плато Мангуп-Кале и Ескі-Кермен у Південно-Західному Криму, у Партеніті, на Південному березі та у Тиритаці, на сході Криму. Більшість досліджених базилік датуються VI – початком VII ст. головним чином на підставі археологічних свідчень.

Більшість розмірів кожної з цих базилік (а також деяких пізніх базилік, побудованих на руїнах ранніх) були скоординовані з використанням числових пропорцій, які, таким чином, були добре відомі архітекторам та будівельникам кримських базилік. Базуючись на існуючих даних, числові пропорції використовувалися незалежно від хронології, специфічних функцій, розміру, важливості та місцезнаходження. Незважаючи на те, що пропорції базилік Криму подібні пропорціям базилік Константинополя, Малої Азії та східної частини Балкан, пропорції кримських базилік не можуть бути розділені на групи чи категорії, кожна з яких відображає ту чи іншу віддалену «модель». Багато базилік Криму об'єднували у собі «столичні» та «малоазійські» пропорції.

Плани, а також багато пропорцій базилік Криму дуже схожі, тим не менш пропорції більшості базилік у деякій мірі все ж відрізняються: зазвичай вони не використовувалися як нормативні формули, шаблони. При будівництві кожної базиліки вибір числових пропорцій залежав від комплексу причин. Використання пропорцій вірогідно напряму не залежало від зовнішнього імпульсу, а скоріше, від існуючих місцевих умов, розміру, важливості та спеціальних функцій базиліки, символічних зв'язків, традиційних практичних правил, добре відомих місцевих багатовікових будівельних методів та, можливо, іноді від особистої переваги архітектора, духівництва чи патронів.

Buchwald H., Zavadskaya I.

Early Christian Basilicas in Crimea and their Numeric Proportions

Summary

The focus of this study is to determine the extent to which numeric (as opposed to geometric) proportions were employed in Christian basilicas of Crimea and which specific numeric proportions were applied; it also attempts to explain why certain proportions may have been chosen by the builders. Numeric proportions were identified in 14 basilicas of Crimea: 10 in Chersonesos, two on the plateaus of Mangup-Kale and Eski-Kermen in southwest Crimea, one in Partenit on the south coast and one in Tyritake, south of modern Kerch at the east end of Crimea. Most reviewed basilicas have reasonably been attributed to the 6th and early 7th centuries based largely upon archaeological evidence.

The major dimensions of each basilica (and of some later basilicas constructed over the ruins of the earlier ones) were coordinated employing numeric proportions. Based upon the existing evidence they were employed in basilicas regardless of chronology, specific function, size, importance and location. While some of the proportions are similar to those of Constantinople, the Balkan east coast and Asia Minor, the basilica proportions of Crimea cannot be divided into categories which reflect the one or the other distant "model": many basilicas of Crimea combine proportions common in the capital with different proportions common in Asia Minor.

The floor plans of the Christian basilicas of Crimea are very similar and many of the proportions are also quite similar, but the proportions of most basilicas differ at least somewhat: they were not usually applied as normative formulas. The reasons for the choice of numeric proportions in each basilica were probably complex: the proportions probably did not usually depend directly upon an impetus from outside the region, but rather upon well known local ongoing construction procedures, traditional rules of thumb, practical advantages, preexisting site conditions, the size and importance of the basilica, special functional or liturgical demands, symbolic or magical references, and perhaps at times personal preferences of the architect, the builders, the clergy or the patrons.

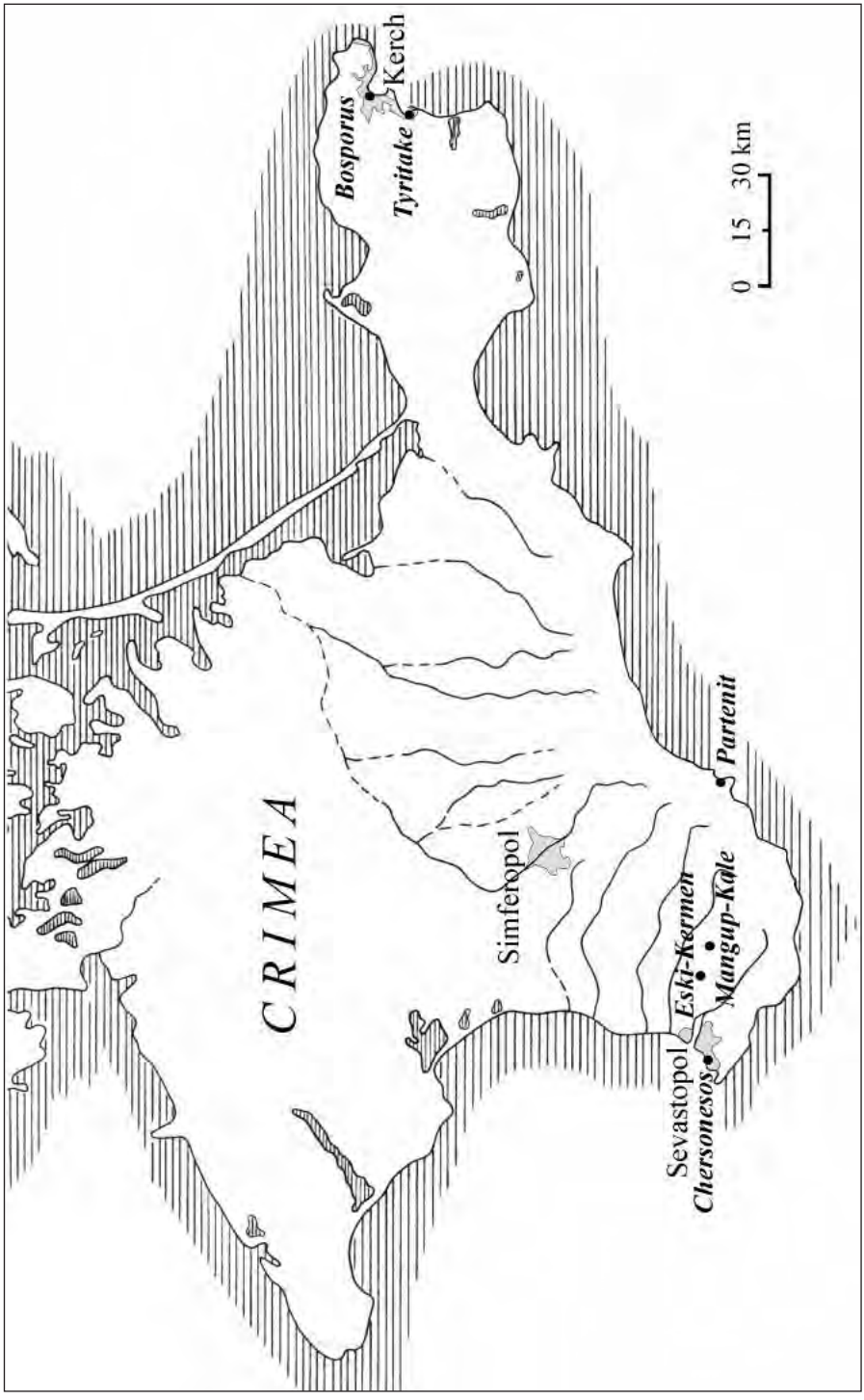

Fig. 1. Map of Crimea.

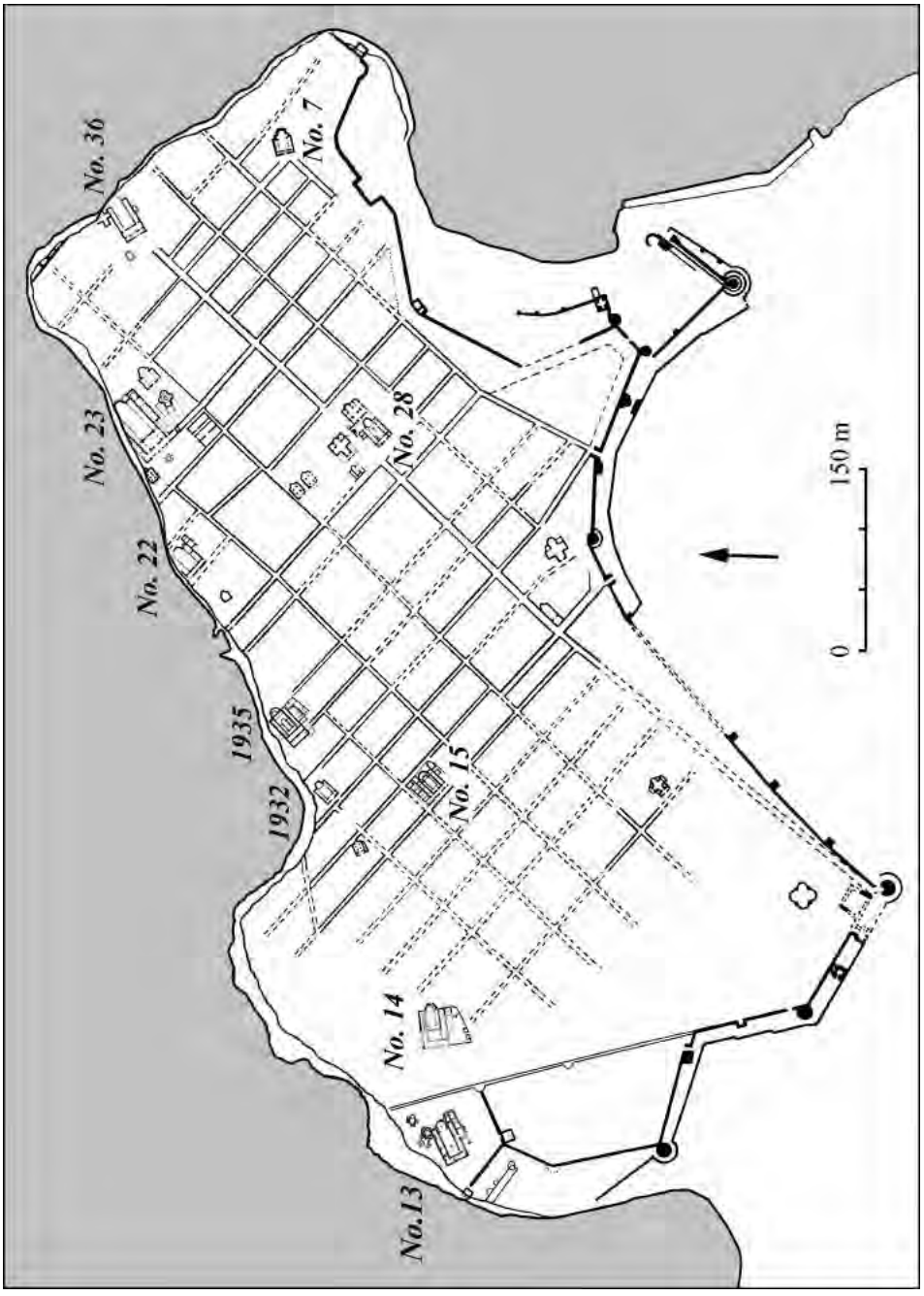

Fig. 2. Plan of Chersonesos with Early Christian Basilicas.

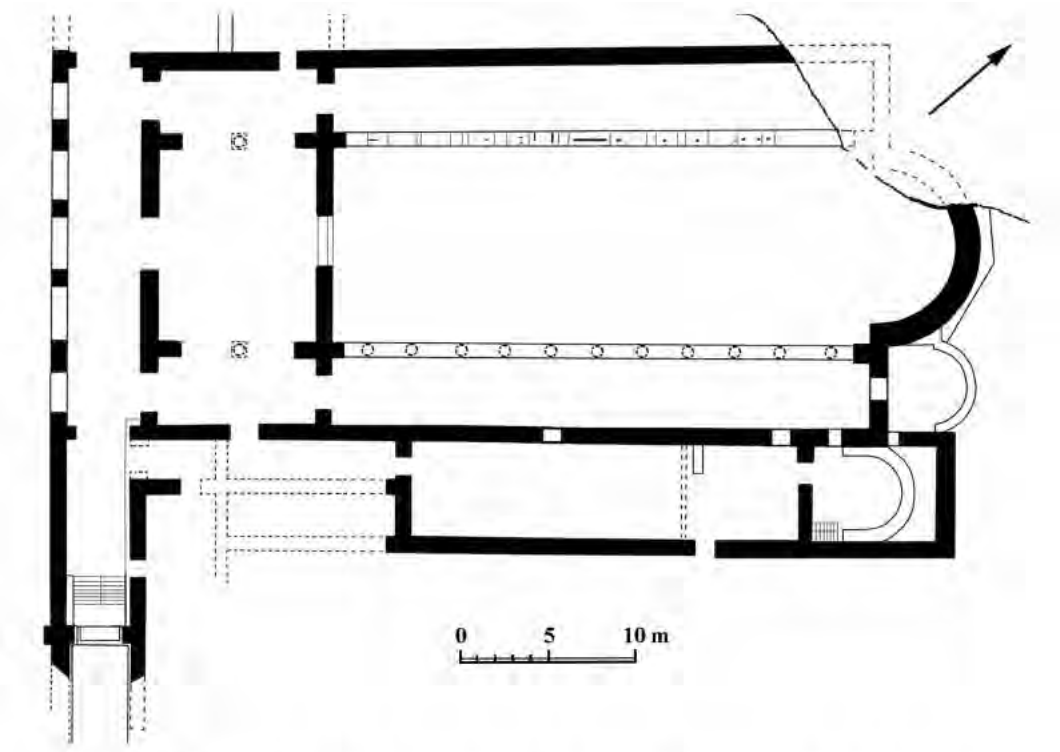

Fig. 3. Church No. 23, "Uvarov Basilica" (after S. Medeksza [20, fig. 44]).

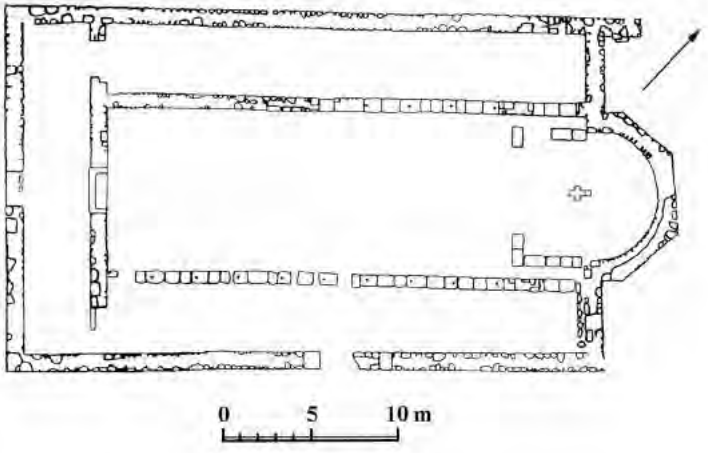

Fig. 4. Church No. 13, "West Basilica". Excavation Plan (after E. Surov [22]).

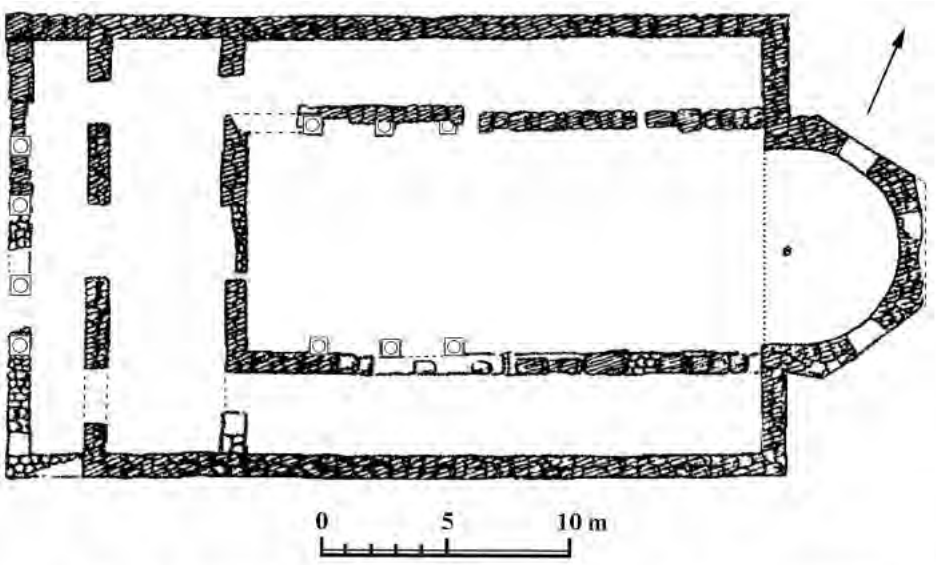

Fig. 5. Church No. 36, "East Basilica". Excavation Plan (after K. Grinevich [117, pl. I]). The walls on the stylobates of the colonnades are later additions.

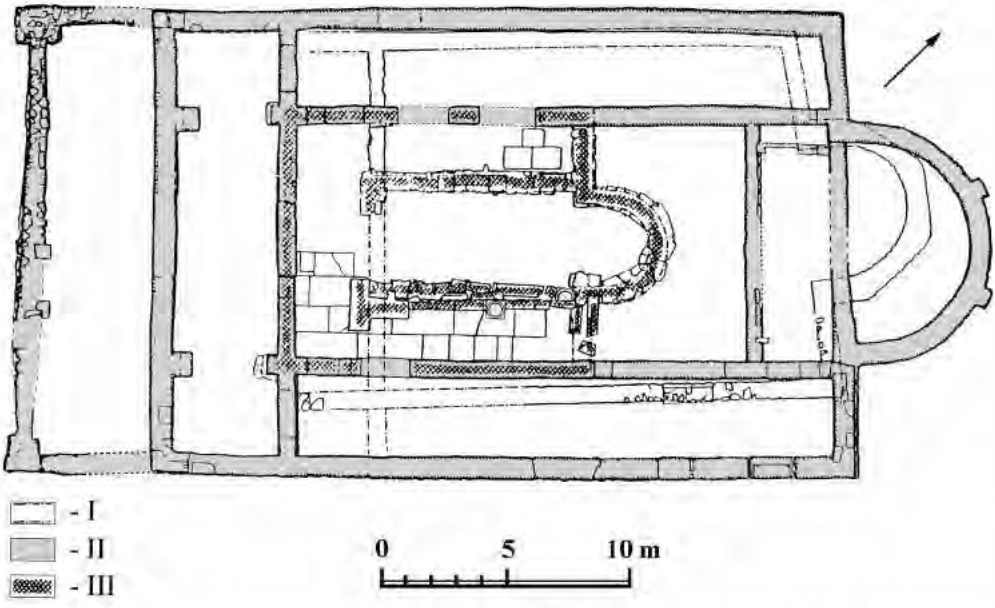

Fig. 6. Basilica 1935. Excavation Plan (after E. Zherebtsov [39, fig. 1]). I – Synagogue; II – Early Basilica; III – Late Basilica.

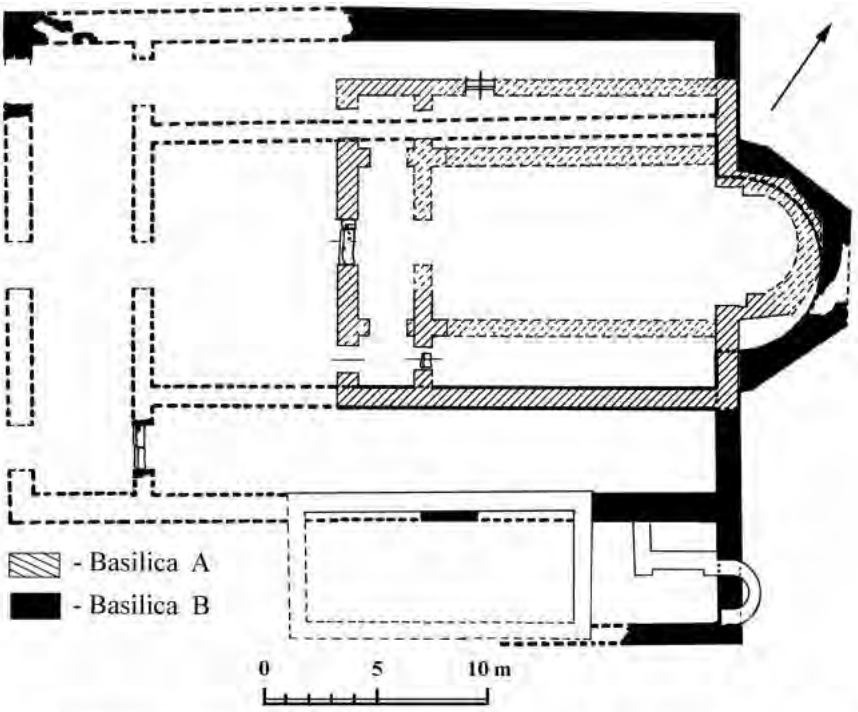

Fig. 7. Church No. 14, "Basilica on the Hill" (after S. Medeksza [44, fig. 33]). The reconstruction is partly hypothetical.

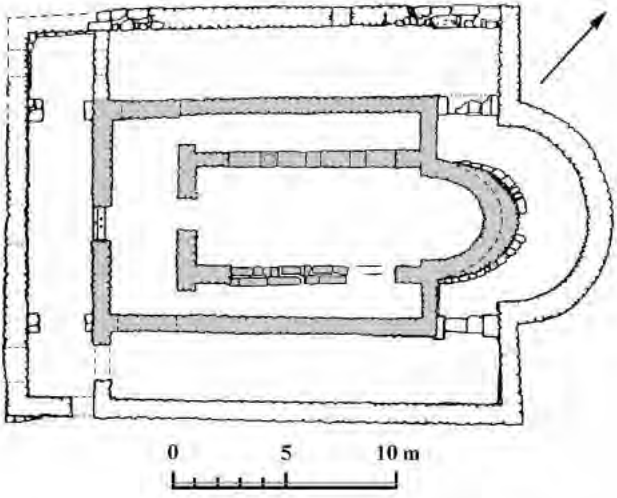

Fig. 8. Church No. 15, "Basilica in a Basilica". Excavation Plan (after S. Ryzhov [48, fig. 1]). A small medieval basilica is located in the nave.

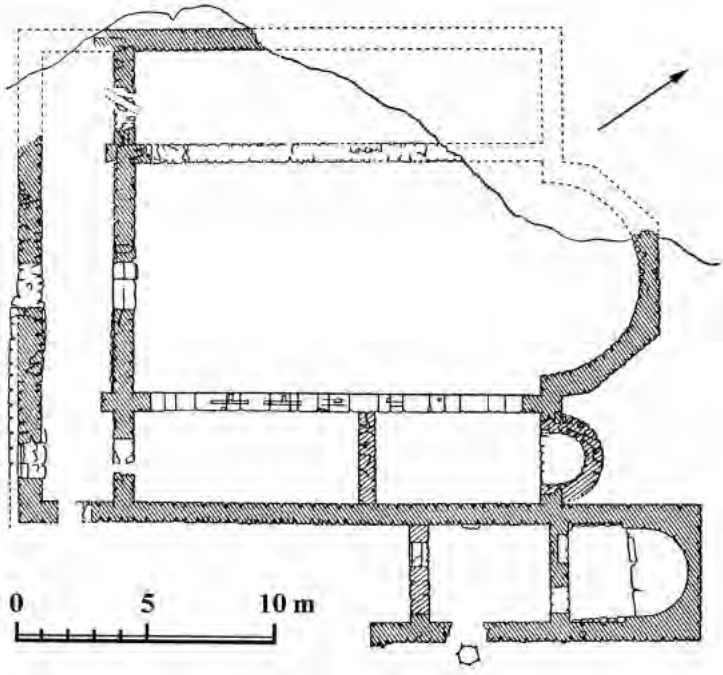

Fig. 9. Church No. 22, "North Basilica". Excavation Plan (after A. Jacobson [5, fig. 75]). The apse and cross wall of the south aisle are later additions.

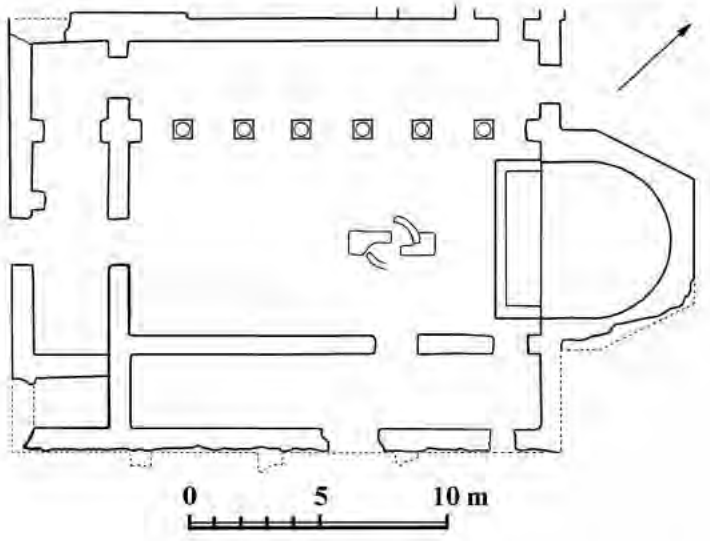

Fig. 10. Church No. 28, from a Site Plan of 1861. The wall over the south stylobate is a later addition (after D. Ainalov [21, fig. 44]).

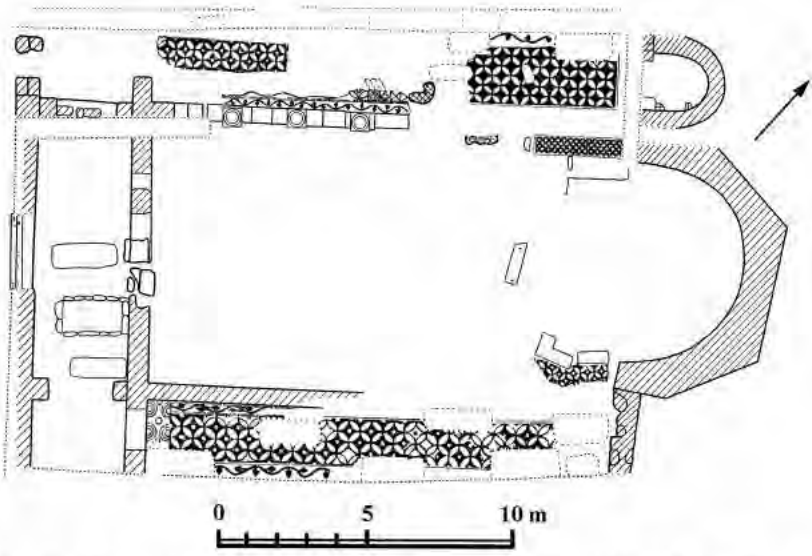

Fig. 11. Basilica 1932. Excavation Plan (after G. Belov [59, pl. II]). The apse of the north aisle is a later addition.

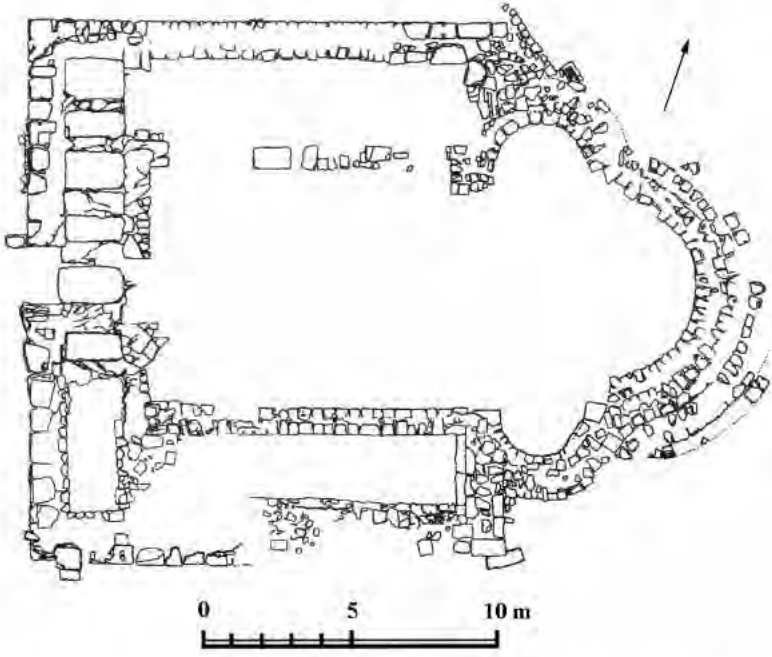

Fig. 12. Church No. 7, "Kruze Basilica". Excavation Plan (after S. Ushakov [69, fig. 1]). The walls over the stylobates are later additions. Graves are located in the narthex.

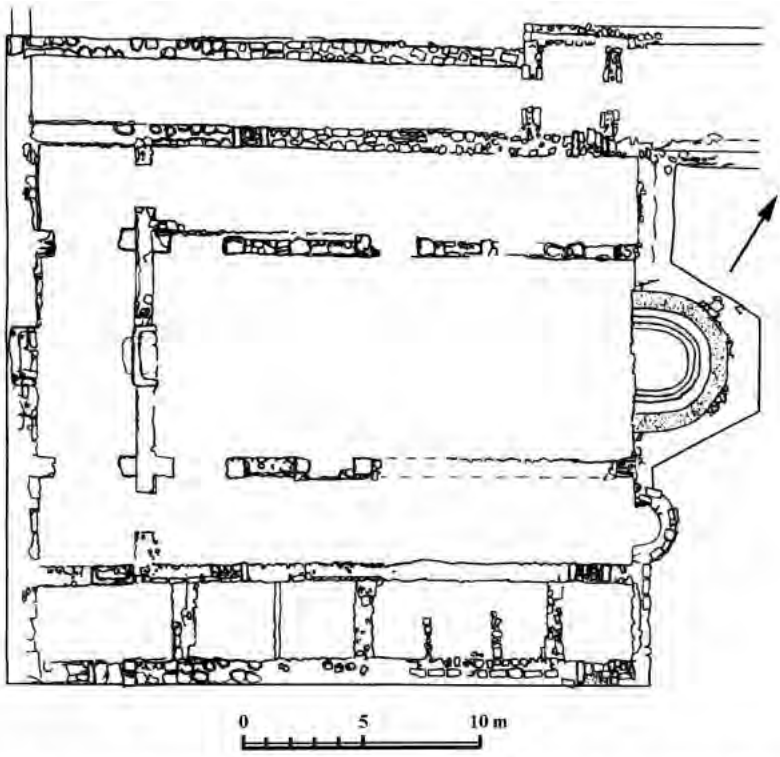

Fig. 13. Christian Basilica on the plateau Mangup Kale. Excavation Plan (after N. Barmina [82, fig. 1]). The apse of the south aisle is a later addition.

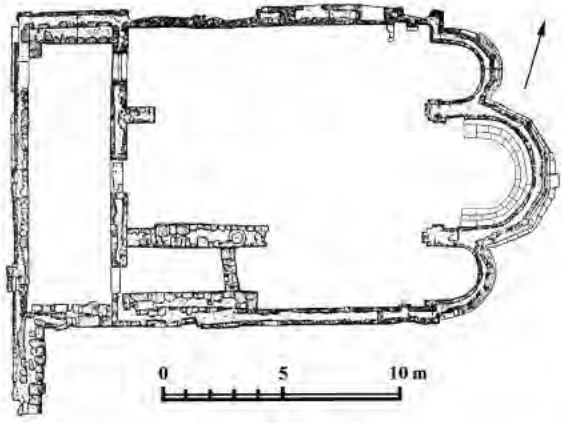

Fig. 14. Christian Basilica on the plateau Eski Kermen. Excavation Plan (after F. Shmit [87, fig. 56]). The three apses and walls inside the south aisle are later additions.

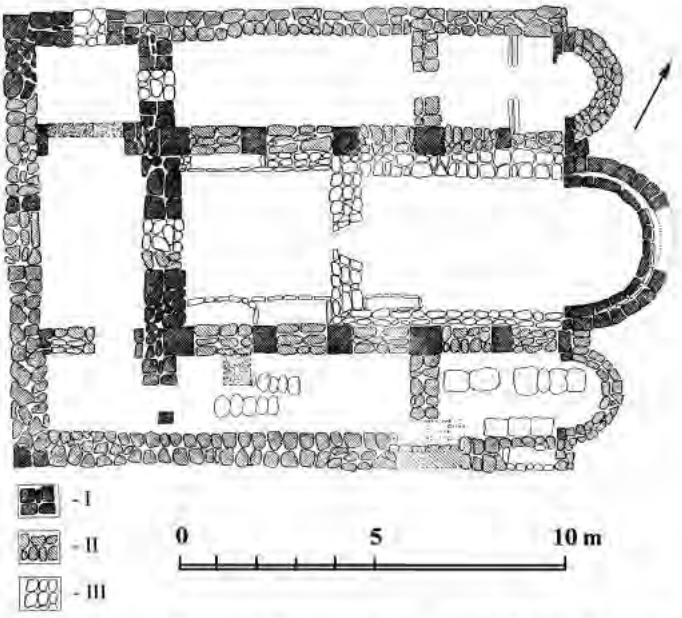

Fig. 15. Christian Basilica in Partenit. Excavation Plan (after N. Repnikov [91, fig. 6]). The flanking apses, walls between the piers, blocked doorways and other repairs are later changes and additions.

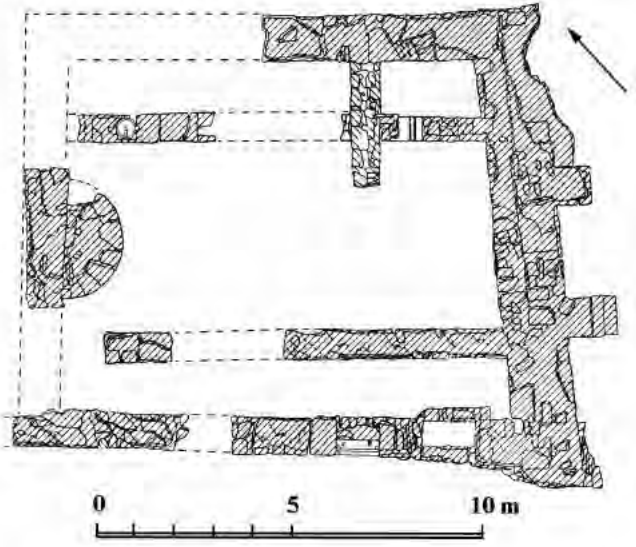

Fig. 16. Christian Basilica in Tyritake. Excavation Plan (after V. Gaidukevitch [97, fig. 1]). Most walls are foundations. Neither apse nor narthex were found.