Offa's Dyke Journal

A Journal for Linear Monuments, Frontiers & Borderlands Research

Volume 5

Edited by Howard Williams

Aims and Scope

Offa's Dyke Journal is a peer-reviewed venue for the publication of high-quality research on the archaeology, history and heritage of linear monuments, frontiers and borderlands. The editors invite submissions that explore dimensions of Offa's Dyke, Wat's Dyke and the 'short dykes' of western Britain, including their life-histories and landscape contexts. *ODJ* will also consider comparative studies on the material culture and monumentality of land divisions, boundaries, frontiers and borderlands from elsewhere in Britain, Europe and beyond from prehistory to the present day. We accept:

1. Notes and Reviews of up to 3,000 words
2. Interim reports on fieldwork of up to 5,000 words
3. Original discussions, syntheses and analyses of up to 10,000 words

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Front cover: Reconstruction of the Olger Dyke at Gårdeby Mark (Jørgen Andersen, Museum Sønderjylland, Arkæologi Haderslev). Cover and logo design by Howard Williams and Liam Delaney.

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The Serpent Ramparts in Ukraine: Fifty Years of Archaeological Research

Florin Curta

Named after a folk tale first recorded in the nineteenth century, the Serpent Ramparts in the Ukraine have been thoroughly investigated archaeologically in the 1970s and 1980s. The results of the excavations clarified the chronology of the earthworks, but also revealed a sophisticated building technique employing timber structures. The relation of the dykes to neighbouring strongholds and especially open settlements have been the focus of the subsequent research. The dates initially advanced for the earthworks (late tenth to early eleventh century) may not apply to all surviving segments, but the initial impetus for the building of the Serpent Ramparts seems to have come from the Rus'-Pecheneg confrontations along the northern boundaries of the steppe belt in Eastern Europe.

Keywords: Ukraine, timber structure, stratigraphy, open settlements, strongholds

Although a prominent feature in the landscape of both Right- and Left-Bank Ukraine, the Serpent Ramparts (*Zmievi valy*) have not attracted scholarly attention before the nineteenth century, and then only after medieval strongholds and towns had already been a subject of investigation. The earthworks were definitely called 'of the Serpent' by that time, for in his *Poetic Outlook on Nature by the Slavs*, the Russian ethnographer Aleksandr N. Afanas'ev (1826–1871) included a folk tale meant to explain the name. According to that tale, the earthworks have been formed in the course of the confrontation between a monster (winged serpent) and two saints, Cosmas and Damian, who were reputedly blacksmiths.[1] Using a pair of gigantic tongs which they forged for the occasion, Cosmas and Damian were able to catch the monster and hitch it to an equally gigantic plough. As they began plowing with this unusually activated tool, the resulting furrow produced a dyke on one side, henceforth called Serpent Wall or Rampart. The furrow marked the territory beyond which the monster was not allowed to pass, but tormented by thirst, the winged serpent dragged the plough to the sea, where it began to drink so much water that it collapsed (Afanas'ev 1865: 559–562).[2]

[1] Although prominent among the Holy Unmercenaries, therefore venerated in the Orthodox Church as healers or physicians much like St Panteleimon or St Agapetus of the Kievan Caves, Sts Cosmas and Damian appear in Ukrainian folk tales as blacksmiths, perhaps because of the chance assonance between the Ukrainian pronunciation of the name of Cosmas (*Kuz'ma*) and the word for smithy (*kuznia*).

[2] A variant of the legend recorded by Lev Padalka has the two saints providing the plough, with the action of capturing and hitching the serpent done by a local hero (*bohatyr*) named Kyrylo Kozhumiaka (Padalka 1914: 8). The same name (Serpent Wall) applies to another, 60.2km-long dyke along the northeastern shore of the Budaki Lagoon. That dyke starts some 3km to the southeast from Shabo (region of Odesa, Ukraine) and reaches Palanca (district of Ştefan Vodă, Republic of Moldova) on the Dniester River (Uhlig 1928: 190).

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The first scholarly attempts to deal with the earthworks in Ukraine moved against the folk etymology, and attributed them to Emperor Trajan, most likely because of comparison with dykes in what are now southern Moldova and southern Romania, where any linear earthwork is designated as *troian*, a word derived from the name of the Roman emperor (Funduklei 1848: 30–31; Grabowski 1850: 72). By the late nineteenth century, the dating moved to the tenth century and was linked to the early Rus' state. However, the discussion was only based on maps and written sources (primarily, the early Rus' annals). In the early twentieth century, the Ukrainian archaeologist Vasyl' Liaskorons'kyi (1859–1928) complained about the lack of any archaeological research (Liaskoronskii 1907: 202 and 206). The interest in such research had nonetheless been prompted by the letter that the historian and archaeologist Mykhaylo Maksymovych (1804–1873) had sent in 1869 to the Archaeological Society in Moscow, describing the Serpent Ramparts (Kuchera 1987c: 5). Fifteen years later, Volodymyr Antonovich (1834–1908) published the most comprehensive description of the earthworks, accompanied by a plan (Antonovich 1884). However, the first archaeological excavations were organised only 90 years later.

Under the direction of Mykhaylo P. Kuchera (1922–1999), the Archaeological Institute in Kiev initiated the archaeological research of the Serpent Ramparts over a period of ten years (1974–1976, 1979, and 1980–1985) (Kuchera and Iura 1976; Kuchera 1983; Kuchera 1986; Kuchera 1987a; Kuchera 1988; see also Priadko 2019: 70–71). A specialist in medieval fortifications, Kuchera defended a dissertation based on that research, which became his first monograph (Kuchera 1987b, published as Kuchera 1987c).[3] Trenches cut the Serpent Ramparts at various points – Zdvyzh, in the Makariv district west of Kiev; in the Vasyl'kiv district to the south-west from that city; along the left bank of the river Dnieper, and along the Sula. The later excavations focused on the dykes along the rivers Bobrytsia, Ros' and Irpin, as well as between the rivers Irpin and Unava, Dnieper and Teteriv, Ros' and Huiva (Kuchera 1987c: 15). The most detailed description so far, complete with a general map of the dykes was published in Kuchera's 1987 monograph (Kuchera 1987c: 19–60 with a general map at 16–17, fig. 4).

The Serpent Ramparts are in fact a series of dykes stretching from west to east, all the way to the River Dnieper, south of Kiev, in Right-Bank Ukraine (Figure 1). The total length of the surviving embankments is about 1,000km, but many segments still visible in the nineteenth century have meanwhile disappeared (Morgunov 2009: 200).[4] The shortest among those surviving is just south of Bilohorodka in the region of Kiev, most

[3] A descendant of Czech colonists, Kuchera lived most of his life in the Ukraine, but identified as Belarusian (Tomashevs'kyi *et al*. 2022: 7). Between 1952 and 1974, he excavated a number of early medieval strongholds in the Lviv region of present-day Ukraine, such as Plisnes'k (in Pidhirtsi) and Khodoriv (Kuchera 1955; Kuchera 1959; Kuchera 1962; Kuchera 1966; Kuchera 1975). By 1974, he was highly regarded as an expert in the military architecture of early Rus'. To this day, Kuchera 1999 remains the most authoritative study on that matter pertaining to the territory of present-day Ukraine.

[4] The least studied segment, which has already disappeared, is the rampart along the right bank of the river Trubezh (north of Pereiaslav[-Khmel'nyts'kyi']). Somewhat better preserved is the rampart on the left bank of the river Oster (to the northeast from Kiev). For segments indicated on a map of 1772, but invisible today, see Morgunov 2009: 203 and 204 fig. 92.

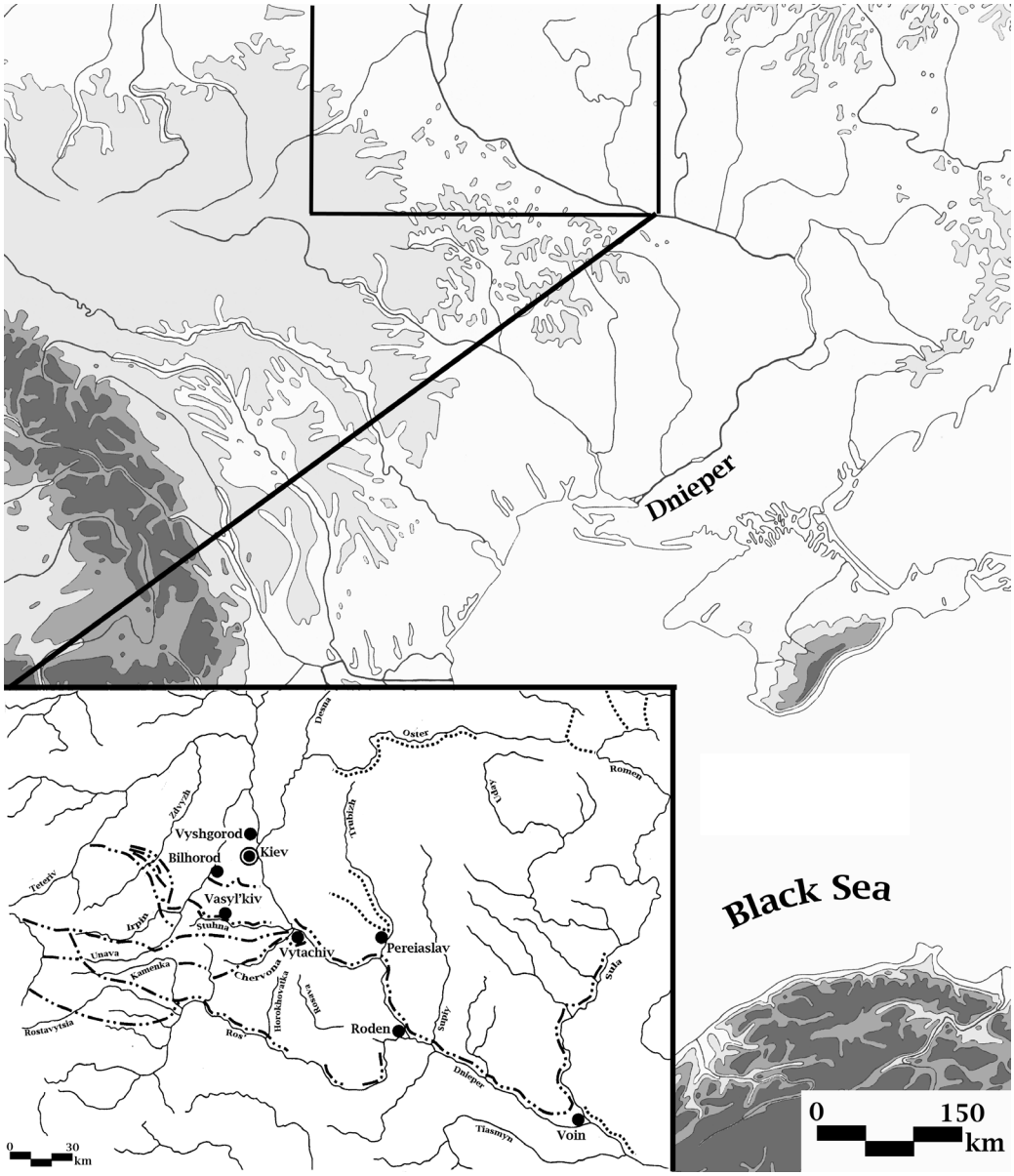

Figure 1: The Serpent Ramparts. Lines with dots indicate the ramparts identified by archaeological means, while dotted lines show remains known from the sources (Insert after Morgunov 2005: 254 fig. 1, with additions)

likely the location of Bilhorod mentioned in the annals. The longest and southernmost begins at the River Huiva, crosses the Rostavytsia and continues along the River Ros' down to its confluence with the Dnieper. On the other side of that river, in Left-Bank Ukraine, there are fewer banks, but the longest of all runs along the eastern bank of the

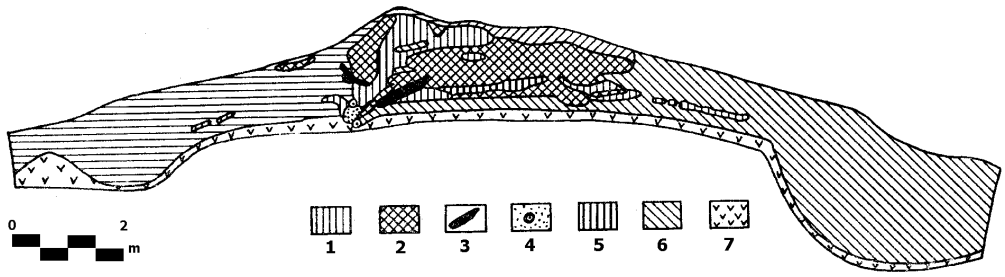

Figure 2: Eastern section of the trench through the dyke running along the left bank of the river Stuhna, near the village of Zarech'e: 1 – yellowish clay; 2 – burnt soil; 3 – charcoal; 4 – timber fragments; 5 – burnt soil mixed with charcoal; 6 – dark grey soil; 7 – virgin soil (after Kuchera 1987c: 84 fig. 45)

Dnieper, with another following the Sula upstream, on the right bank.[5] In both Right- and Left-Bank Ukraine, the earthworks follow river banks (Siverka, Bobrytsia, Stuhna, Ros', Dnieper, Sula and Irpin), in some cases linking one river to another. The longest surviving segment is in fact the one between the rivers Teteriv and Irpin – 66km (of the original 148km). This is in fact not a continuous, linear embankment, but a group of four dykes running in parallel and then joining together right before reaching the left bank of the Irpin (Kuchera 1987c: 25 fig. 9). Similarly, to the northeast from Stebliv, the dyke running along the left bank of the river Ros' is superposed by another, the so-called 'small dyke' (Kuchera 1987c: 40 fig. 18). Intersections of dykes have also been noted elsewhere (Kowalczyk 1969: 159 fig. 2; Kuchera 1987c: 44 fig. 20, 46 fig. 22). The chronological relations between those dykes have not so far been explored, even though, at least in the case of those located to the north-east, east and southeast from the city of Pereiaslav, on the left bank of the Dnieper, a date in the early Middle Ages seems probable (Kuchera 1987c: 57–60; Rozdobud'ko and Teteria 1997; Vovkodav *et al.* 2021; for a history of research on the Pereiaslav earthworks, see Vovkodav 2015).

Two kinds of ramparts may be distinguished—some with ditches to the south or southeast, others in the form of escarpments, with no ditches. The latter are found especially along the River Sula, immediately on its right bank, which suggests that the riverbed was treated as a ditch (Morgunov 1998: 34). No traces of palisades either in front or upon the dykes have so far been found. There is great variation in the size of the ramparts and the adjacent ditches. While the ramparts on the left bank of the River Stuhna has been preserved to a still impressive height of 3m (Figure 2), the one on the opposite bank barely reaches 0.75m in height (Kuchera 1987c: 22 and 36). In the former case, the rampart is 20m wide, while in the latter it is ten times narrower (2–3m). Most

[5] According to Kuchera 1987c: 63 with table 1, the dyke along the left bank of the Dnieper was initially 200km long, but the segments preserved to this day are no longer than 4km. For the fortifications along the river Sula, see also Morgunov 1998.

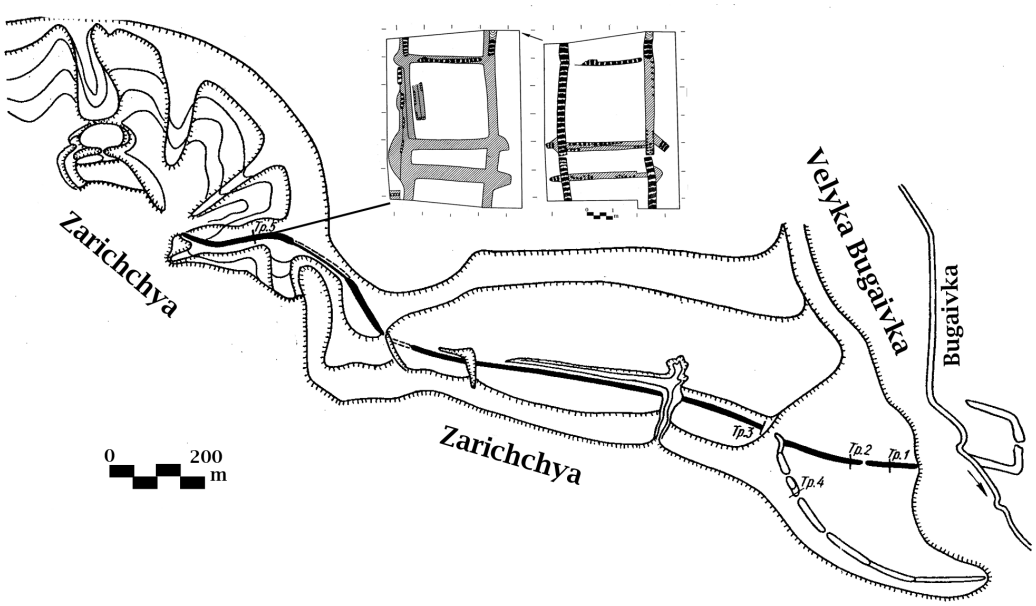

Figure 3: The eastern end of the dyke running along the left bank of the river Stuhna, with the timber frame (middle and lower sections) identified in trench 5 cut across the rampart near the village of Zarichchya. 'Tp' refers to trench, North to top (after Kuchera 1987c: 22 fig. 6 and 86 fig. 47)

other segments are still between 0.5 and 2.4m high, with variations in width between 6.5 and 14m (Kuchera 1987c: 20, 25, 33, 36, 37, 40, 41 and 54-55). Ditches are also quite different from each other. That of the northernmost dyke on the outskirts of Kiev is no more than 4m wide and as much as 0.5m deep. By contrast, the ditch of the segment between the Unava and the Irpin rivers reaches 13m in width, with a depth between 1 and 1.5m (Kuchera 1987c: 33 and 37). Similarly, the ditch of the segment running along the left bank of the Ros' is 1.5 to 2.5m wide and 0.20m deep, while the ditch of the dyke along the left bank of the Dnieper is 8.5m wide and 0.80m deep (Kuchera 1987c: 41 and 54–55). Such variation strongly suggests different strategies for the construction of the ramparts, even though it is difficult to assess chronological differences on the basis of such observations. Nonetheless, it is beyond doubt that none of those ditches was meant to be filled with water. Moreover, there is no evidence of repair or several phases of construction on any individual segment of the dykes.

That variation is not necessarily an indication of different dates results from the examination of the fabric. Kuchera's excavations revealed the internal structure of the ramparts and the method by which they were built. Only a few segments are simple earthen ramparts. For example, the excavations carried out near Pylypcha (Bila Tserkva district, region of Kiev), at the confluence of the Ros' and Rostavytsia rivers, revealed a 5 to 5.5m-wide rampart, the preserved height of which is 1.3m, with a ditch on the southern side that is 2.4m deep (Kuchera 1987c: 165 and 166 fig. 134). Another earthen

rampart is known as the 'little dyke' and runs on the left bank of the river Ros'. Both dykes are very different from the rest of the Serpent Ramparts that have an inner timber frame, the remains of which showed the exclusive use of large oaks.[6] For example, the segment along the left bank of the Stuhna River between the villages of Velyka Bugaivka and Zarichchya was examined archaeologically in 1982 in four different spots (Kuchera 1987c: 83–85 and 90; 86 fig. 47). Two of them (trenches 1 and 5) were next to strongholds built immediately next to the rampart. The traces of the timber frame beams in trench 5 were easily recognisable (Figure 3). The unit of the frame discovered in the trench was 2.8m wide and 2.8m long. To judge from the eastern section of the trench, the frame was filled with different soil than that appearing on the sides of the rampart (Kuchera 1987c: 86 fig. 48). A different kind of timber construction was identified in trenches across the rampart between the rivers Irpin and Teteriv near Lubs'ke (Kuchera 1987c: 90–92; 90–91 fig. 54; 92 fig. 55; 93 fig. 56). The 1983 excavations revealed a frame filled with fragments of timber piled on top of each other, with no particular arrangement (Figure 4). Those fragments may well have been those that resulted from the trimming of the tree trunks meant for the frame, or pieces for which the builders had no other use.[7] A trench that cut through the rampart that runs along the left bank of the Dnieper, near the village of Lipliave (across the river from Kaniv, in the Cherkasy region of Ukraine) revealed yet another kind of timber construction (Kuchera and Iura 1976: 198–202; 200 fig. 2; 201 fig. 3; 202 fig. 4; Kuchera 1987c: 130 and 131 fig. 96) (Figure 5). Here, the tree trunks were placed on top of each other, neatly arranged in layers, but without a frame. A similar chest-like structure has been identified on the right bank of the Bobrytsia near the village of Zabyr'ia (Kuchera 1987c: 132 and fig. 98), in one of the ramparts crossing the river Zdvyzh near Fasivochka (district of Makariv, in the Kiev region; Kuchera 1987c: 132–133 and 136; 133 figs. 99-100), in the rampart running along the left bank of the river Ros', near the village of Tomylivka (Bila Tserkva district, region of Kiev; Kuchera 1987c: 136-137 and 140; 137 fig. 105; 138–139 fig. 106-107), as well as in the rampart along the right bank of the Sula near the village of V'iazikov (Lubny district, region of Poltava; Kuchera 1987c: 141 and 145 fig. 114). In all cases, the chest structure consists of timber elements, often laid in the direction of the rampart, sometimes across it as well. The timber elements do not appear to have been halved, in many cases the builders used entire trees. Unfortunately, no dendrochronological analysis has ever been carried out on any of those timber remains, assuming of course that surviving samples had a sufficient number of rings.[8] On the basis of Kuchera's reconstructions (Kuchera 1987c: 123, 125–127 and 130; 155–161; 124 fig. 91; 156 fig. 127), the complex fabric of the ramparts

[6] For a broader, comparative approach to the typology of dykes, see Kuchera 1997.

[7] According to Kuchera 1987c: 93, the pile inside the timber frame included primarily fragments of oak, and a few of beech wood.

[8] The technology was certainly available at the time of the excavations, for it was applied to early medieval, timber buildings excavated in the 1970s in the Podil of Kiev (Sagaydak 1979; see also Sergeeva 2017). Judging by the photographs published in Kuchera 1987c: 92 fig. 55 and 94 figs. 57–58, the tree trunks were sufficiently large (wide) to allow for dendrochronological analysis. However, the samples from Podil were of pine, while primarily oak was used for the timber constructions of the ramparts. No dendrochronological scale for oak was available at that time and it remains a desideratum of the current research in the Ukraine.

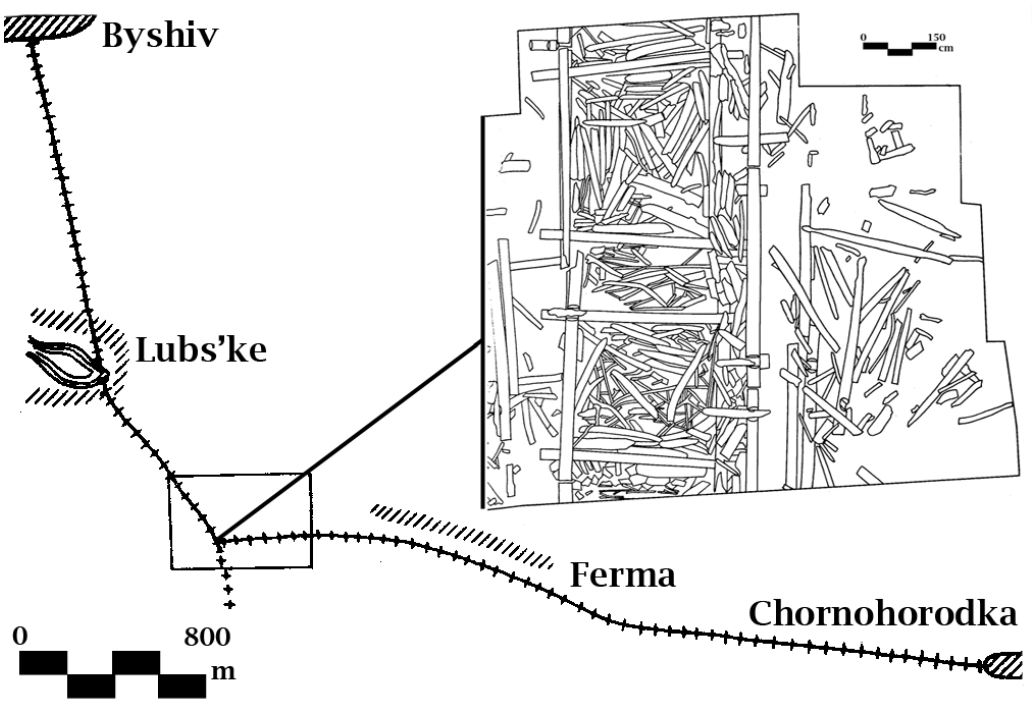

Figure 4: A detail of the timber construction of the rampart between the Zdvyzh and Irpin rivers identified in the 1983 excavations near the village of Lubs'ke, North to top (after Kuchera 1987c: 91 fig. 54)

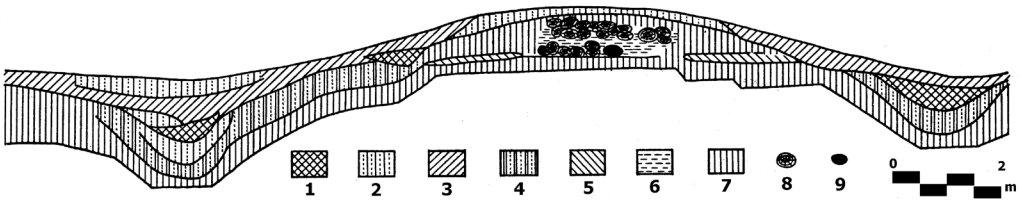

Figure 5: Northern section of the trench through the dyke and the ditch along the left bank of the river Dnieper, near the village of Lipliave: 1 – dark grey soil; 2 – light grey soil; 3 – yellowish soil with dark inclusions; 4 – black soil; 5 – yellow soil; 6 – yellow soil with grey inclusions; 7 – dark yellow soil with dark grey inclusions; 8 – tree trunks; 9 – rotten tree trunks (after Kuchera 1987c: 131 fig. 96)

seems to distinguish them fundamentally from all other, simple earthworks in the region, both prehistoric and of a later medieval age. In fact, the chest structure was believed to have been a technology borrowed from the lands to the west from Rus', such as Poland (Kuchera 1987c: 155; e.g. Żurowski 1957; Gediga 1973; Górecki and Łastowiecki 2016). Since in those lands it appears only on early medieval strongholds, that was interpreted as an indirect indication that the Serpent Ramparts were dated to the early Middle Ages as well.[9] However, the use of timber structures for the construction of ramparts has meanwhile been documented on a number of ninth- to tenth-century stronghold sites such as Liubsha (near Staraia Ladoga, Russia) and Riurikovo gorodishche (near Novgorod, Russia). Moreover, the remains of a similar structure have been found in the ditch of the stronghold at Kiev ('Vladimir's Town'), the last building period of which is dated between 970 and 990 (Nosov *et al*. 2000: 37; Riabinin and Dubashinskii 2002: 198 and 201; Petrov 2005: 122 and 130 fig. 4.5; Mikhailov 2010; see also Eremeev and Dziuba 2010: 153–158). Consequently, the idea of a West Slavic influence has now lost its popularity. Nonetheless, the new data strengthened the idea that both the timber frame and the chest structure may be used to anchor the chronology of the Serpent Ramparts to the late first and the early second millennium (for a detailed discussion, see Morgunov 2009: 38–51).

Kuchera's excavations have produced clear evidence not only to confirm that chronology, but also to narrow down the date for the construction of at least some of the most important segments. Despite the enormous potential of dendrochronology, no samples have been collected from any of the timber structures. Instead, 28 samples from different segments were radiocarbon dated between 1974 and 1983, in other words before the accelerated mass spectrometry became widely available. For various reasons, the results are utterly unreliable (Kuchera 1987c: 67 table 2). Much more trustworthy are Kuchera's stratigraphic observations. Near the village of Sushky (Kaniv district, region of Cherkasy), the dyke running along the left bank of the Dnieper cuts through a seventh-century settlement of the Pen'kivka culture, which itself superposes another, third- to fourth century settlement of the Kiev culture (Kuchera 1987c: 69 and fig. 32). In just one season of excavation (1980), O.M. Prykhodniuk and E.L. Gorokhovskii excavated six sunken-floored buildings, nine pits and a smelting furnace, all of which produced a large quantity of pottery (Prykhodniuk 1990; Prykhodniuk 1998: 148).[10] Just how long after the seventh century may the ramparts have been built results from tenth- to eleventh-century sherds of pottery thrown on a tournette and decorated with combed ornament, which were found in the rampart on the left bank of the river Irpin near the village of Lubs'ke (Kuchera 1987c: 71–72; 71 fig. 36/1–4). However, at its eastern end located

[9] Whether timber frame or chest structure, the two types of timber constructions for the Serpent Ramparts co-existed and were used even on one and the same segment, the alternation of building technique depending upon the local availability of timber (Kuchera 1987a: 128).

[10] According to Kuchera 1987a: 129, the dyke running along the right bank of the river Sula cuts through another sixth- to seventh-century settlement at its northernmost end, in Lubny. In fact, a stronghold was built behind the dyke over a *cemetery* site attributed to the Pen'kivka culture (Sukhobokov and Iurenko 1990).

between the villages of Velyka Bugaivka and Zarichchya, the dyke on the left bank of the Stuhna River cuts through an early medieval settlement, which was dated between the tenth and the thirteenth century, primarily on the basis of the pottery (Kuchera 1987c: 72). Such pottery dated to the eleventh century was found in the ditch of the rampart, which suggests an earlier, perhaps late tenth to early eleventh-century date for the ditch and the rampart. Within a trench across the dyke running between the Stuhna and the Irpin rivers, to the west from the city of Vasyl'kiv (region of Kiev), an axe dated at that exact time was found just above the basis of the rampart (Kuchera 1987a: 129; Kuchera 1987c: 73–74; 71 fig. 36/5; 74 fig. 38). Another trench across the dyke on the left bank of the Ros' near Stebliv (district of Zvenyhorodka, region of Cherkasy) showed that the rampart superposed an eleventh- to twelfth-century settlement. The dyke must have been built after the mid-twelfth century, when the settlement was abandoned, but no later than the thirteenth century (Kuchera 1987c: 77). Clearly, the Serpent Ramparts were not all built at once. In addition, not all were meant to be continuous lines of defense. Along the right bank of the River Sula, there are several gaps, most likely where marshes or flooded areas made fortification unnecessary.

According to Mykhaylo Kuchera, the Serpent Ramparts were part of a complex system of defense created in the late tenth and during the first half of the eleventh century for the protection of Kiev from attacks, primarily by nomads, from the south. They were combined with a great number of strongholds built at key positions along the ramparts or between them (Kuchera 1987c: 176–180; 78–79 fig. 44). The evidence for that is largely from written, not archaeological sources. Under the year AM 6496 (AD 988), the *Primary Chronicle* mentions that Vladimir 'founded forts on the Desna, the Oster', the Trubezh, the Sula and the Stugna', which he populated with people from the northern parts of Rus' (Karskii 1926: 121; Cross and Sherbowitz-Wetzor 1953: 119). Bilhorod was established in 991 and populated with settlers from other towns (Karskii 1926: 122; Cross and Sherbowitz-Wetzor 1953: 119). Except Bilhorod, few of those forts have been explored by archaeological means and where available, the evidence does not always confirm the coincidence in time between ramparts and strongholds (e.g. Morgunov 2003; for Bilhorod, see Blifel'd 1975 and Nepomiashchykh 2010). In fact, Kuchera's interpretation has been challenged recently by the Russian archaeologist Iurii I. Morgunov (1947–2018). On the basis of his own excavations in the valley of the Sula River, Morgunov advanced the idea that most forts post-dated ramparts. For example, at Chutovka, on the Lower Sula, an open settlement existed in the late tenth and early eleventh century right behind the dyke running on the right bank of the river. Between c. 1000 and c. 1050, the settlement shrank, and shortly before or after 1100, a fort was built above the northern end of the settlement area. Throughout the first half of the twelfth century, another settlement grew around the fort, at a time when the dyke must not have been in operation anymore (Morgunov 1996: 135 fig. 46; Morgunov 2005: 259 and 260 fig. 5). Similarly, at Mykolaivka (district of Zvenyhorodka, region of Cherkasy), the dyke running on the left bank of the Ros' River cuts through an earlier settlement located next to a fort, which is believed to have been built under Yaroslav the Wise (1019–1054). In other words, the earliest evidence on the

site is that from the open settlement, which is dated to the late tenth century (Morgunov 2005: 263). At Mykolaivka, as well as elsewhere, the building of the fort or stronghold post-dates the dyke.

According to Mykhaylo Kuchera, by the late eleventh century, in the context of the political and military changes mentioned in the Rus' annals (the so-called *Primary Chronicle*), the dykes lost their purpose and reason for existence.[11] However, some segments of the Serpent Ramparts may have become obsolete already in the mid-eleventh century (Kuchera 1987a: 130 and 132). Kuchera therefore believed that the dykes were built within the two decades separating the conversion to Christianity (988) from Bruno of Querfurt's letter to King Henry II (1008), in which the 'kingdom' of Vladimir is described as being 'enclosed on all sides with the longest and most solid of fences' (Karwasińska 1973: 99; English translation from North 2019). According to Kuchera, the latest segments were those built along the Huiva and the Ros' rivers in the 1030s (Kuchera 1987a: 131). Although disputed by some (Kowalczyk 1989), this chronology has now been accepted by both archaeologists and historians (Franklin and Shepard 1996: 170–172).[12] Iurii Morgunov believes that the two decades in Kuchera's scenario were instrumental not only for the erection of the earthworks, but also for the building of the earliest forts and the planting of large open settlements behind the dykes (Morgunov 1999). However, Morgunov shifted the moment at which the construction of the Serpent Ramparts started to an earlier date, namely during the last years of Sviatoslav's reign (945–972). According to him, the ruler of Kiev may have drawn inspiration for the dykes from the earthworks he had seen in Bulgaria during the military involvement of the Rus' in the Balkans (Morgunov 2005: 266; Morgunov 2019: 55; for the military involvement of the Rus' in the Balkans between 967 and 971, see Kryshkovskii 1952; Stokes 1962; Busetto 1996; Poppe 2007; Bonarek 2018; Ivanov 2021; for the earthworks of Bulgaria, see Rashev 1982).[13] Only 16 years separate the death of Sviatoslav at the hands of the Pechenegs in the Lower Dnieper region from the conversion of his son, Vladimir, which, according to Kuchera, is the *post terminus quem* for the Serpent Ramparts (for the death of Sviatoslav in battle with the Pechenegs, see Paroń 2005–2009). However, without the use of dendrochronology, the resolution of the dates so far proposed for the dykes is not sufficient for verifying either Morgunov's hypothesis or Kuchera's scenario.

[11] For the *Primary Chronicle* as belonging, in fact, to the annalistic genre, see Gimon and Shchavelev 2022: 453–456. The nature of the information typical for this historiographic genre is particularly important for the discussion of the role that the Serpent Ramparts played in the military events of the late tenth and early eleventh century.

[12] This may have something to do with the idea that from Vladimir to Yaroslav the Wise, the territory of the Rus' state increased considerably, particularly to the south, where the border moved more than 100 km to the banks of the Ros' and Sula rivers. Some believe that the inclusion by such means of the vast areas of the forest-steppe belt in Eastern Europe into the Rus' state dislodged the Pecheneg nomads from their summer encampments and pushed them farther to the south, which must have contributed to the increased number of raids upon Kievan Rus' (Paroń 2021: 298).

[13] Morgunov's idea directly contradicts Kuchera's interpretation of the dykes in the Ukraine as inspired by the military architecture of Central Europe. There are no timber constructions in any of the ramparts in Southeastern Europe.

It is also impossible to interpret the existing network of dykes and to distinguish between possible phases, in spite of Kuchera's otherwise plausible idea that the southernmost segments, especially those along the Ros' and the Sula rivers were built at a later date. That four parallel dykes were built across the river Zdvyzh in the direction of the river Irpin raises important questions, especially since all four are behind (to the north from) another dyke that links the left bank of the Unava to the right bank of the Teteriv, again, across the Zdvyzh. Equally enigmatic is the purpose of the dyke running from the headwaters of the Irpin to the bend of the river Ros' near present-day Bila Tserkva, especially since that rampart seems to link two pre-existing dykes, one running from the Huiva to the Dnieper, the other from the Huiva to the Ros', and then following the left bank of the latter river.[14] Problems of chronology will have to be solved first, before any interpretation of this situation can be advanced.

Why were the Serpent Ramparts built? Kuchera and Morgunov agree on the association between the dykes and the increasing number of Pecheneg raids on Kiev. The conquest and sack of Itil and subsequent collapse of Khazaria were accompanied by a sudden burst of Rus' power in the steppe lands, the most important aspect of which was the occupation of Sarkel (Beleckii 2016; Paroń 2021: 284). Kiev was attacked and sacked by the Pechenegs in 968, while the Rus' under Sviatoslav were in the Balkans. The Pechenegs attacked the city again in 990, while in 992 they came 'from the opposite side of the Dnieper, in the direction of the Sula,' before they were stopped by Vladimir's troops (Karskii 1926: 122–124; Cross and Sherbowitz-Wetzor 1953: 119–120). Four years later, however, the Pechenegs had the upper hand, for they defeated Vladimir near Vasilev (now Vasyl'kiv) on the river Stuhna (Karskii 1926: 124–127; Cross and Sherbowitz-Wetzor 1953: 121). The next year, they put Bilhorod under siege, but without success; they returned there in 1004 (Paroń 2021: 295). The traditional interpretation—that put forward by Kuchera—is that the Serpent Ramparts were a response to those raids. According to Iurii Morgunov, there is a smaller number of raids precisely during the first decade of the eleventh century, when the ramparts were about to be finished (Morgunov 2010: 62–63 and 62 fig. 1). However, if the Pechenegs could put Bilhorod under siege twice within seven years, the building of the dykes must not have been either disturbed by their attacks or very effective in stopping the raids. Moreover, the Polish historian Aleksander Paroń has recently suggested that the Pecheneg raids were a response to the building of the ramparts and other political and military measures that Vladimir had taken to encroach into the Pecheneg territory to the south (Paroń 2021: 300). If so, the ramparts were less for defense, and more to 'show-off': as a way for the Rus' ruler to impose upon the landscape in Right-Bank Ukraine the mark of his authority and to lay claims to territories until then under the control of the nomads. This interpretation echoes more recent studies that regard earthworks in early medieval Europe as means 'to anchor local identities to the ship of state because of the commitment to place and the sheer power, ancient and traditional, they revealed' (Squatriti 2002: 65; see also Squatriti 2021).

[14] Moreover, a shorter dyke was built most likely at an even later time to link the right bank of the Huiva to the 'intermediary' dyke.

Such an approach in turn raises a number of questions for which the current state of research on the Serpent Ramparts has no answers. Who built the dykes? How large was the labour force and how long did it take to finish the ramparts? Given the existence of the timber constructions, one would need to include in calculations the estimated time for felling the trees, transporting them to the building site and erecting the frame or the chest structure. What is the relation between the construction sites and the open settlements that may have existed at that same time in the vicinity? Can the former be regarded as part of the building project infrastructure, perhaps supplying food and equipment to the workers? Could the workers themselves have resided in those settlements? If Kuchera's interpretation is correct, could the timber constructions be an indication that the labour force came from the western lands that Vladimir had conquered in the early 980s (Kuczyński 1949; Koroliuk 1952; Sikora and Wołoszyn 2011)? In other words, was the labour force made up of prisoners of war (see Dzik 2022)? If so, what was the relation between those people and the population that Vladimir brought from the northern parts of Rus' in order to populate the forts he established in the region? Finally, what is the relation between the rampart running on the left bank of the river Ros' and the cemetery recently found on the opposite bank, at Ostriv (district of Rokytne, region of Kiev), with its extraordinary parallels to the Baltic milieu (Shiroukhov et al. 2019; Diachenko 2020)?[15] No new archaeological excavations have been carried out to verify Kuchera's conclusions. However, there is a great interest in using remote sensing for the verification and correction of his map of the Serpent Ramparts (Vovkodav 2015, 2016, 2018, 2020a, 2020b, 2020c, 2020d). Following Boris Rybakov (1949: 22), Kuchera dated to the early Iron Age the so-called Pereiaslav dykes on which this new technique has now been used.[16] With the map corrections made possible by remote sensing, another set of questions emerges, all linked to the role of the prehistoric earthworks in the early Middle Ages (Morgunov 2019: 137–139). Were they used or reused, and if so, for what purpose? How did the medieval builders conceptualize the spatial arrangement of the prehistoric dykes?

None of those questions can be answered without new excavations. Given the war situation in the Ukraine, however, it is unlikely that the archaeological research of the Serpent Ramparts will be a priority any time in the foreseeable future. The damage done to the ramparts is also impossible to assess, although the operations in March 2022 associated with

[15] The relation between late tenth- and early eleventh-century strongholds, ramparts and cemeteries is perhaps the most urgent task of the future research. For cemeteries, see Shcherbakivskii 1925; Motsia 1993; Bibikov 2014. For a breakthrough in research, see Borysov 2019.

[16] By the early 1980s, the issue seemed settled, given the discovery in 1966 of materials dated to the sixth century BC and attributed to Scythians (Shramko 1967: 200–201). However, salvage excavations carried out 30 years later just east of Mala Karatul' (to the southeast from Pereiaslav) brought to light ceramic materials dated to the third or fourth century and attributed to the Chernyakhov culture. Those materials were found immediately underneath the rampart linking Mala Karatul' to Strokova, to the north (Rozdobud'ko and Tereria 1997: 140). Remains of a timber construction were also found in a trial excavation of 2019 near the village of Khotsky (south of Mala Karatul'; Vovkodav *et al*. 2021). While none of those observations is conclusive, together they suggest a much later date for the Pereiaslav dykes than advanced by Rybakov, Shramko and Kuchera (Vovkodav 2022).

the Russian attempt at surrounding Kiev are said to have reached the area south of Makariv where four dykes cross the river Zdvyzh in the direction of the river Irpin (Interactive Map 2022). None of the dykes located farther to the south seems to have been affected by the military operations, which never moved too deep into Right-Bank Ukraine.

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