

Earthwork elements of defensive systems of small strongholds in the Kingdom of Slavonia

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FORTIFIKACIJE, OBRAMBENI SUSTAVI I STRUKTURE U PROŠLOSTI



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FOREWORD

This edition brings the conference papers from the 4th International Conference on Mediaeval Archaeology organised by the Institute of Archaeology in Zagreb in 2017. It is a result of efforts of the medievalists of the Institute of Archaeology to establish continued international gathering of the academic community in Zagreb in order to discuss current archaeological topics on mediaeval archeology. Each year the topic of the conference covers the specific issues of mediaeval archeology, and the conference proceedings are published in the edition *Zbornik Instituta za arheologiju / Serta Instituti Archaeologici* (ZIA). Proceedings of the 1st Conference *Groblja i pogrebni običaji u srednjem i ranom novom vijeku na prostoru sjeverne Hrvatske (Cemeteries and funeral customs in mediaeval and early modern period in the northern Croatia)*, held in 2014, have been published in ZIA, Vol. 4 in 2016. Proceedings of the 2nd Conference *Srednjovjekovna naselja u svjetlu arheoloških izvora (Mediaeval settlements in the light of archaeological sources)*, held in 2015, have been published in ZIA, Vol. 6 in 2017, and Proceedings of the 3rd Conference *Sacralization of Landscapes and sacred places*, held in 2017, have been published in ZIA, Vol. 10 in 2018.

The 4th International Scientific Conference on Mediaeval Archaeology **Fortifications, defence systems, structures and features in the past**, organized by the **Institute of Archaeology** in cooperation with **the Croatian Institute of History**, took place from the 7th till the 9th of June 2017 in Zagreb. Our wish was to encourage the researchers to present, through this topic, their knowledge on technical solutions of certain defensive elements of different fortifications, different manifestations and changes in the organization of defensive structures and systems over time, with regard to the causes of those changes and identification of possible patterns of defence systems, structures and features in a certain area, region or in a certain archaeological or historical period.

Although based on knowledge yielded mostly by the archaeological research, the topics of the Conference exceeded the basic framework of the archaeological discipline, and the it has been conceived as a multidisciplinary encounter of different ideas, approaches, methods, results and interpretations. Furthermore, the topics of the Conference have been open to wider archaeological and historical periods, not only the Middle Ages. We were interested in how different developmental processes took place before the Middle Ages (Prehistory, Roman Period), which inevitably affected the human life in the Middle Ages, and how different phenomena of the Mediaeval Time influenced the human life in the Modern Period as well.

The Conference has gathered large number of experts and professionals from different countries, who have presented their research, discussed the topic and exchanged their knowledge. As many as 107 participants took part in the conference, coming from Croatia, Hungary, Czech Republic, Italy, Slovenia, Serbia, Romania, Bosnia and Herzegovina, Poland, Russia, Slovakia, Turkey, Denmark, Germany, Macedonia and Austria. All in all, they contributed a total of 74 presentations by lectures and 14 posters. Within the Conference programme museum exhibition *Mediaeval Fortification Architecture* by the authors Ratko Ivanušec and Zorislav Horvat was opened at the Archaeological Museum in Zagreb, while at the Croatian Institute of History the photo-exhibition by Darko Antolković entitled *Encounters with Fortifications* has been presented. Conference participants have jointly visited the permanent exhibition of the Zagreb City Museum, and an expert excursion to Medvedgrad Castle has also been organized.

Since the aim of the scientific conference was to perceive the given topic in an interdisciplinary and multidisciplinary manner, we are pleased that in this book, besides the papers dealing with mediaeval fortifications, we have the opportunity to publish papers that study the defence systems in the preceding and following periods (Prehistory, Antiquity, Modern Period) and that archaeological studies are complemented by the studies of historians, art historians and architects as well.

Here we publish 37 reviewed presentations which were adapted into papers by their authors. By publishing the Proceedings in English, we have tried to provide to the authors the widest visibility in the international scientific community.

I would like to thank once again all the participants of the Conference for excellent cooperation, as well as to the institutions and individuals that helped make it a great success. I also thank the colleagues from the Institute of Archaeology for their help in the organization of the conference and the publication of these proceedings. We are also grateful to the Croatian Institute of History for their support in the organization of the Conference, as well as to the Archaeological Museum in Zagreb and the Zagreb City Museum for the accompanying programmes of the Conference. Acknowledgements go also to the reviewers and the members of the Editorial board of the volume. The publication of the proceedings would not be possible without the financial support of the Croatian Ministry of Science and Education.

We sincerely hope that the conference papers gathered in this publication are going to inspire archaeologists and colleagues from various scientific disciplines in their further research of the fortifications and different defence systems, structures and features dating from the Middle Ages as well as from other archaeological and historical periods.

Tatjana Tkalčec

EARTHWORK ELEMENTS OF DEFENSIVE SYSTEMS OF SMALL STRONGHOLDS IN THE KINGDOM OF SLAVONIA

Medieval hill forts and lowland moated fortifications are densely distributed throughout the entire area of the interfluvium of the rivers Mura, Drava, Sava and Danube. The focus of the paper is put on the area of mediaeval Kingdom of Slavonia where nearly hundred sites of that type was documented, out of which 20% was archeologically excavated. These small castles consist of a central elevation protected by a ditch and a rampart or a system of ditches and ramparts. Unlike stone-castles, they were built mostly using earth and timber. This type of fortifications, dating from the 12th/13th to the beginning of the 16th century, is closely linked to the Slavonian and Hungarian nobility, corresponding to the type of late mediaeval fortifications and strongholds that were characteristic for the nobility in the wider European area.

Key words: small stronghold, nobles, fortification, castle, earthen rampart, mound, ditch, the Kingdom of Slavonia, 12th–beginning of 16th century

Small hill forts and lowland moated and mounded sites are found throughout the entire area bordered by the Drava and Sava rivers, in the northern Pannonian part of Croatia, which in the Middle Ages was called the Kingdom of Slavonia (*Regnum Sclavoniae*). These motte-type sites are called *gradišta* in Croatian.

Their prominent layouts in the landscape attracted attention of different professionals (Pribaković 1956; Horvat 1954; and especially Lovrenčević 1985; 1990), including archaeologists (Bobovec 1991; 1994; 1997; 2003; Bobovec, Sekelj Ivančan 2003; Tkalčec, Sekelj Ivančan 2004; Tkalčec 2007a; 2012a; 2013: 143–152; Tkalčec, Kostešić 2014). More detailed archaeological research was conducted on nearly 100 sites on the area of the core of the so called *Regnum Sclavoniae*, more precisely on the territory of mediaeval Križevci and Varažadin (and/with Zagorje) counties (Tkalčec 2004; 2019a) (Fig. 1).

Common characteristic of these sites are earthwork defensive systems such as earthen ramparts, mounds and moats/ditches. There is evident concentration of such fortifications near settlements, main road communications and water courses. They are located on naturally prominent positions on hilltops (Fig. 2) and slopes or in the plains where they often exploit local water courses and groundwater as an additional element of defence (Fig. 3).

According to layout, we can distinguish circular, rectangular, triangular or elongated fortifications, and according to structure and articulation of their central elevations they can consist of one, two or more parts, where the main elevation is used for the residence of the landlord himself, while others (if any) are used for economic outbuildings and defensive purposes (guardhouse/observation posts) (Fig. 4). The span of the central plateau ranges from 20 to 100 meters. Most hill forts' central elevations have a span of about 40 to 50 m. Further size of a hill fort depends on the number of defence layers (defensive moats and ramparts). Seventy nine percent of all sites consist of one elevation (so called one-part fortifications), while there are 11% of the two-part ones, and 1% of other types (three or more parts). Two-part fortifications make up 30% of lowland, and 70% of highland ones. The layout of the fortifications mostly derives from the natural configuration of the terrain; therefore the most common are those with circular and oval shaped central/main elevation (61%).

Lowland fortifications are usually circular or slightly irregularly oval, almost circular. They can be surrounded by a ditch

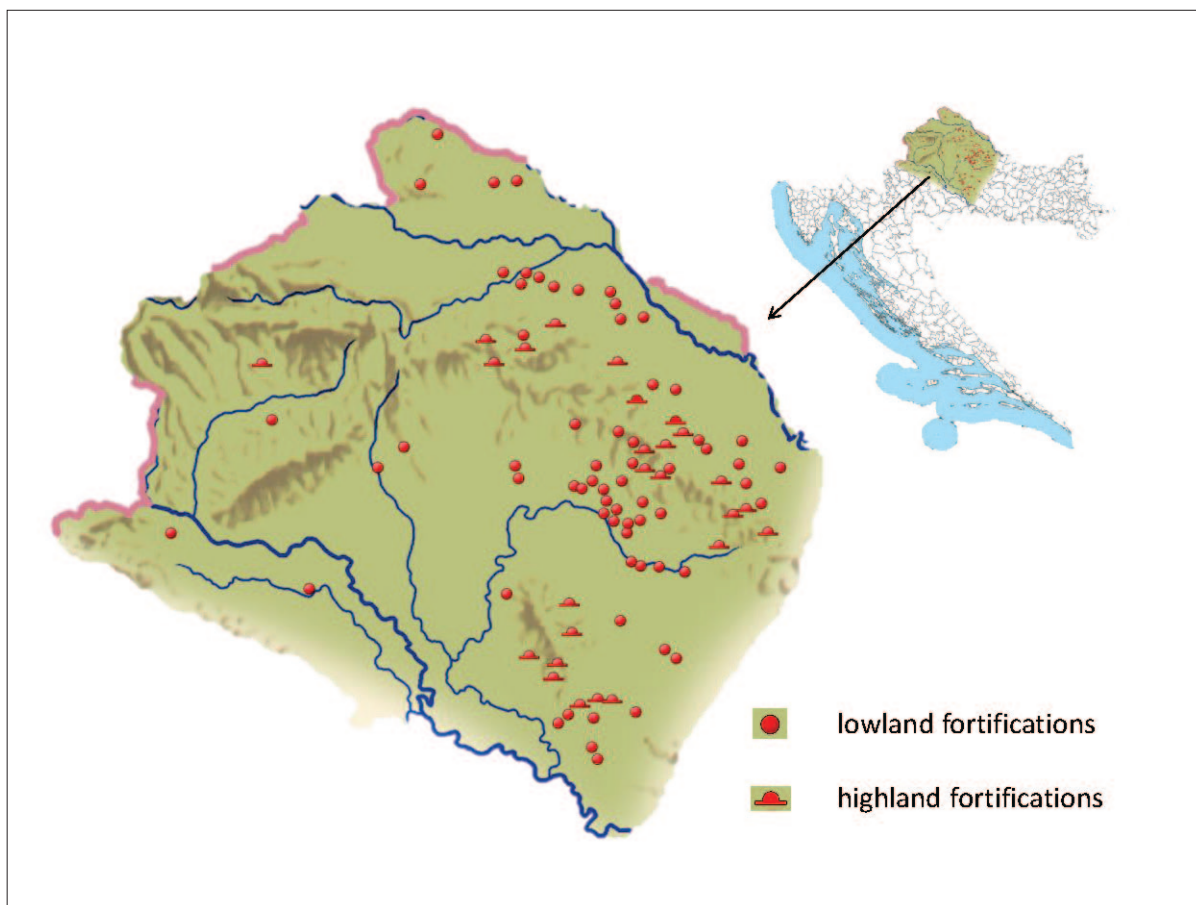


Fig. 1 Distribution of sites in the North-Western Croatia (map made by: T. Tkalčec)

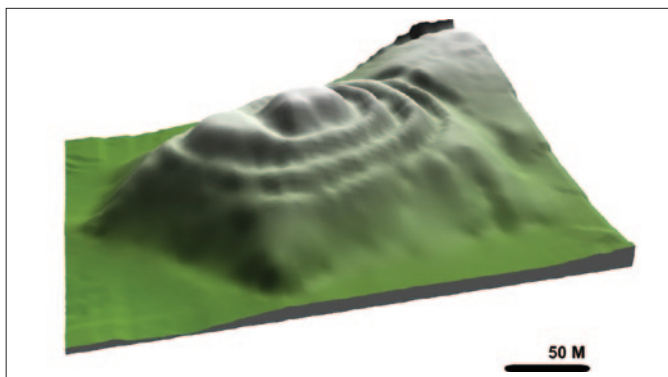


Fig. 2 Špišić Bukovica – Gradina hillfort, 3D digital relief model (Tkalčec, Kostešić 2014 : 93, fig. 14)



Fig. 3 Pobjenik – Gradići, lowland fortification, a view of the central elevation surrounded by the defensive ditch (photo by: T. Tkalčec, 2011)

and a rampart or by a system of concentric rings of moats and ramparts. Additional bulwarks and embankments are also present on some sites in order to organize the defended access to the main fort, or to form and protect a bailey (Fig. 5). Sometimes the ramparts are extended suggesting that additional towers might have been placed on those spots (Fig. 6).

Square-shaped fortifications represent a remarkable example of adaptation to the terrain with special needs (18%), and it appears that they belong to the very end of the Late Middle Ages. Their common feature is that their only defence is a single moat and a rampart (Fig. 7).

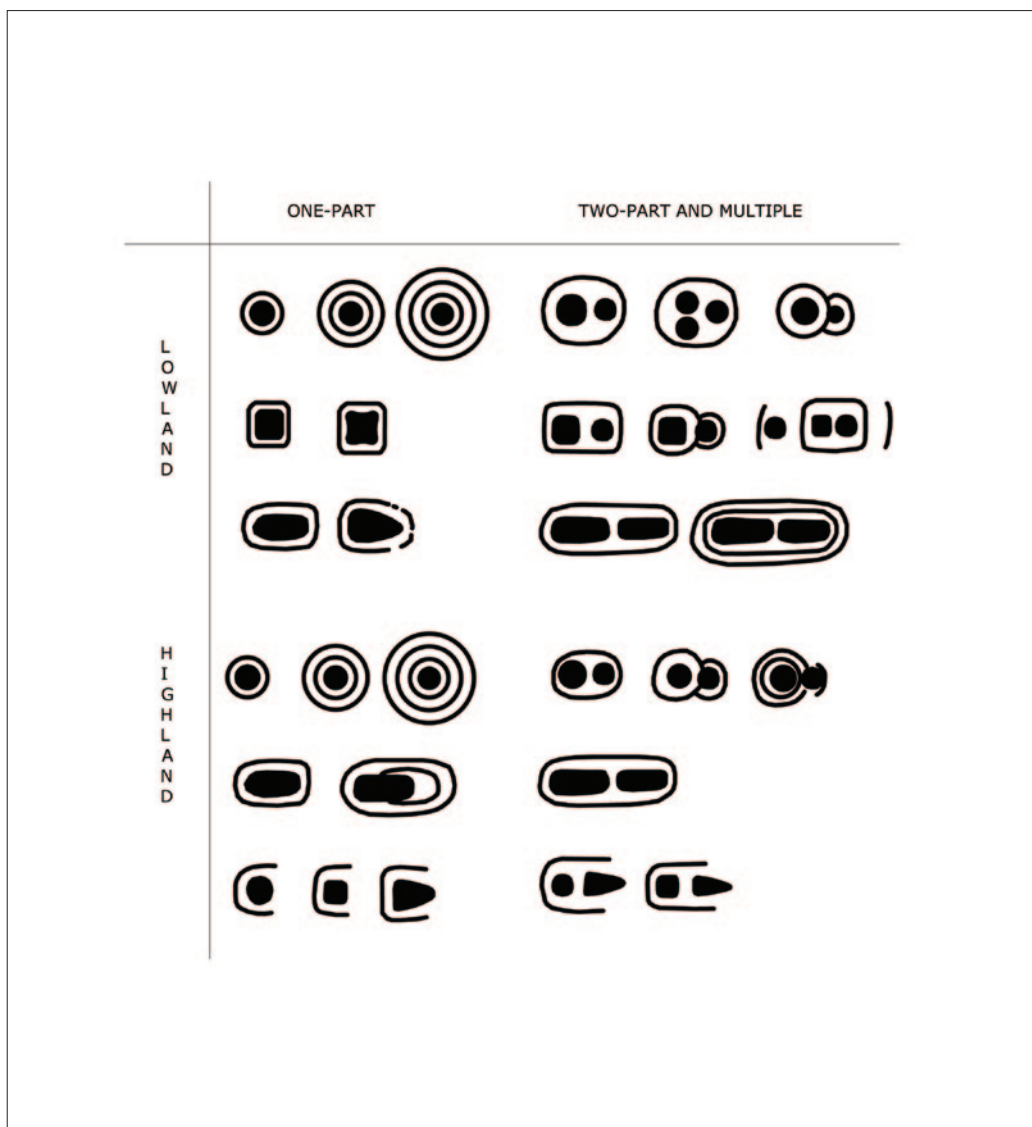


Fig. 4 Types of fortifications according to the position and shape (Tkalčec 2004: 243, tab. 6)

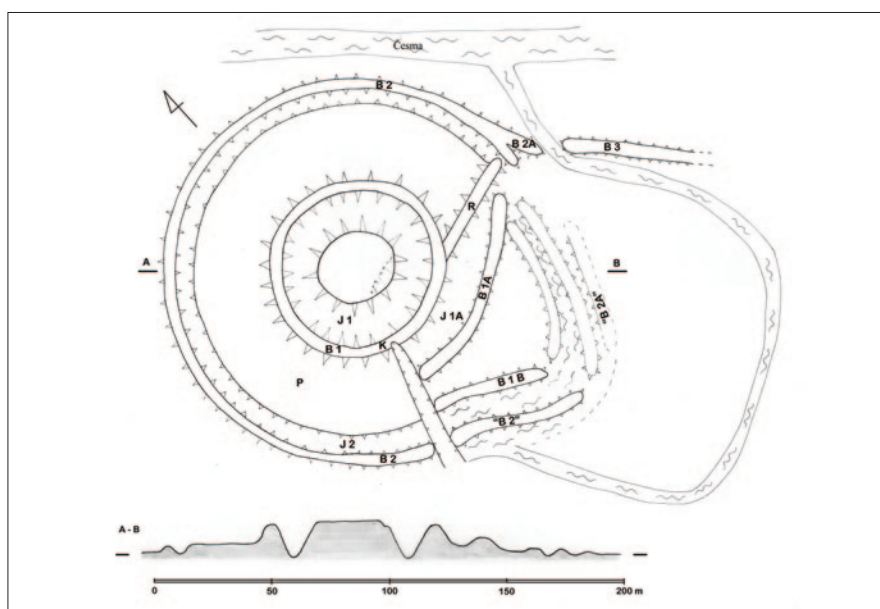


Fig. 5 Stara Ploščica – Grčina, lowland fortification (drawing by: T. Tkalčec)

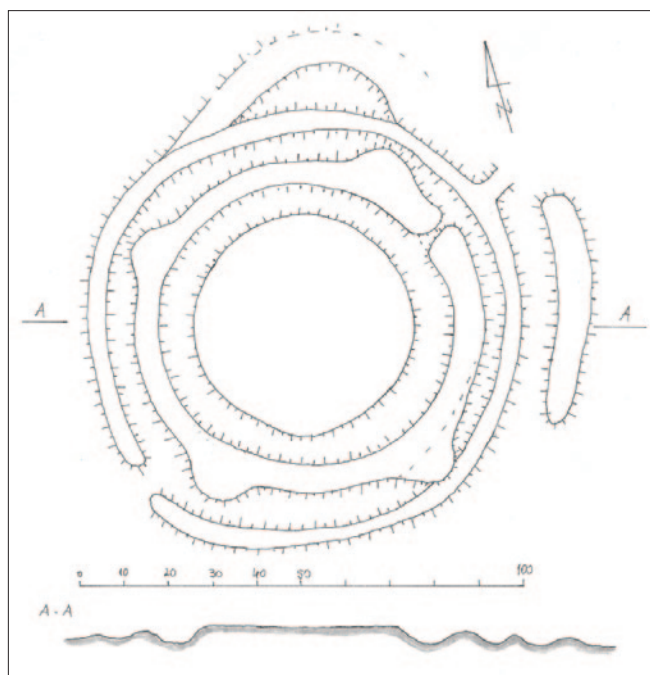


Fig. 6 Orlovac – Orlov grad, lowland fortification (drawing by: T. Tkalčec)

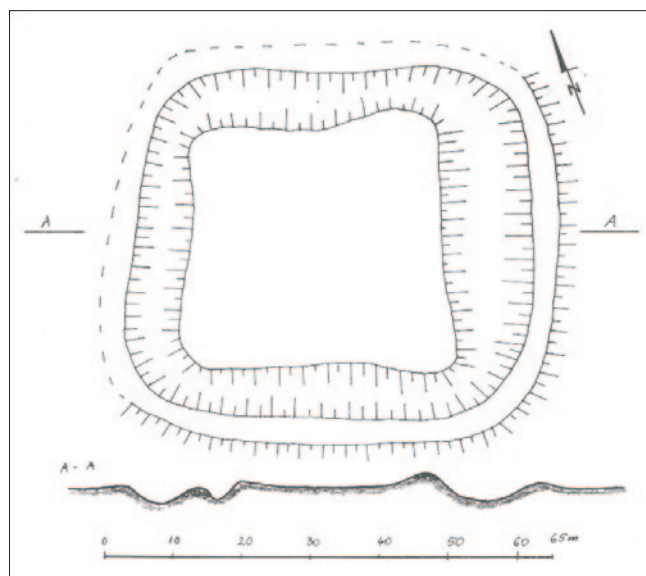


Fig. 7 Veliki Poganac – Gradina, lowland fortification (drawing by: T. Tkalčec)

Elongated oval-rectangular central elevation is present at 9% of fortifications, while other forms are extremely rare. Hill forts of an extremely elongated oval shape exploit natural head crests taking advantage of them by digging moats and erecting ramparts.

Particularly noteworthy is a group of fortifications with a so-called “horseshoe-shaped” rampart which can only be found in the highland type of fortifications. They are located on the slope of a hill, one side being cut into it and defended by a moat and a rampart, while on the other side a steep slope served as natural protection. Their central elevation could have been either in a circular, square or triangular layout (Fig. 8).

Most of these fortifications in the woodlands are in good condition while those in the lowland plains are badly preserved due to modern intensive agricultural works.

Archaeological excavations – mostly probe excavations and very limited in scope – have been carried out on around 20 % of them (Tkalčec 2004: 251–252), while systematic excavations were carried out on only two fortifications in entire Croatia. The first one – Gradište in Mrsunjski Lug near Slavonski Brod – was conducted more than 65 years ago by Zdenko Vinski, and it was published as the catalogue of the exhibition (Vinski, Vinski Gasparini 1950), whereas the second one was carried out ca. 20 years ago and published only partially (Kušer 2004).

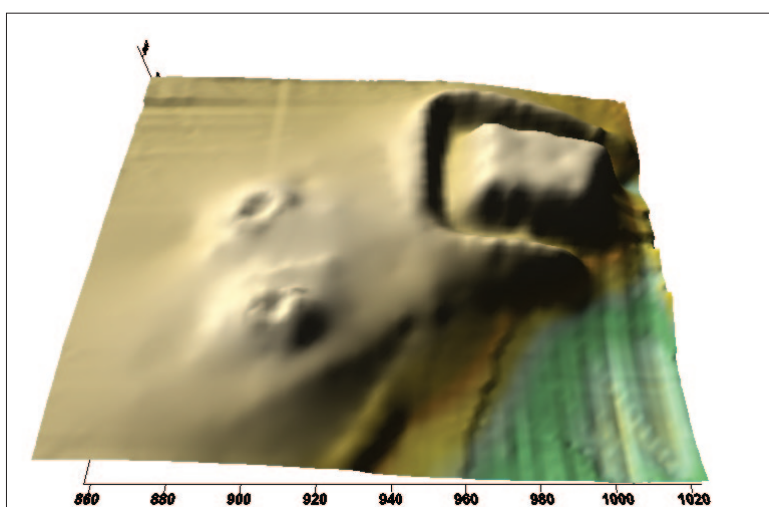


Fig. 8 Osijek Vojakovački – Mihalj hillfort, 3D digital relief model (made by: T. Tkalčec)

It was the very research of doyen of Croatian early medieval archaeology Zdenko Vinski which in fact raised the interest of Croatian archaeologists in this type of archaeological sites. Besides Mrsunjski Lug, Zdenko Vinski has also excavated a fortification in Sveti Peter Ludbreški. He has dated both sites from the 10th to the 13th century, most probably from the 11th century onward (Vinski, Vinski Gasparini 1959; Vinski 1949: 238).

According to our present knowledge, this dating is too early for the material found in these excavations. None of the found fragments of ceramic vessels from these researches can be dated before the 14th century. It seems that Z. Vinski himself also hinted that this type of archaeological sites in Croatia was to be attributed to later periods, because his interest in the continuation of the excavation of numerous moated and mounded sites in Croatia soon ceased.

However, his original thinking has made deep roots in the scientific literature and to date some experts leave open the possibility that in these locations traces of the earlier Slavic fortifications should be sought (eg. Karač 1991; 1992; 2006; Goss 2012; cf. also the article by V. P. Goss in this edition). Further archaeological research is necessary, but as it stands now no findings from the Early Middle Ages were found at any of the sites.

Dating to the Late Middle Ages was further confirmed in the probe archaeological excavations in Moslavina region in 1960s at several lowland fortifications of that type (Kutina–Plovdin Grad in 1963, Sokolovac–Turski Grad in 1964 and Tomašica – Gradina in 1966) and at the highland fortifications (Mikluška–Šanac Gradina in 1963, Selište–Kutinec Grad in 1966 and Kutina–Turski Stol in 1966) (Iveković 1968).

All findings from these excavations indicate that these sites were used as strongholds of the local medieval nobility from the 13th century (eventually 12th century) until the 16th century.

Such dating was further confirmed by all the archaeological researches carried out in the subsequent years: Virgrad near Županja in 1970 (Minichreiter 1970), Budrovac–Gradina in 1976 (Marković 1980: 35–39), Staro Čiče–Gradišće in early 1980s (Težak–Gregl, Vojvoda 1987), Javorovac–Poljan Grad in 1982 (Marković 1985: 148–150), Gradišće near Nedelišće in 1984 (Tomičić 1985a; 1990: 123–127; Tomičić, Vidović 1985: 14) and the revisional excavations at the same site in 2000s (Kovačić 2008; Marcijuš 2009), then fortification Močvare 2 or Popov Dol in Dvorišće near Turčišće in 1984 (Tomičić 1985b; Tomičić, Vidović 1985, 15) with more extensive excavations of the same site in 2014 named later as Gradišće in Turčišće (Krmpotić et al 2017) and Sigetec Ludbreški–Marof 1 in 1987 (Registar 1997: 128, no. 394). At the end of the 1990, a trial excavation was carried out at the hill fort Špišić Bukovica–Gradina (Salajić 2001) and at the fortification around the Gothic church of the Assumption of the Blessed Virgin Mary in Donja Glogovnica (Homen 1998; 2000a; 2000b). Beginning with 2000s even more intensive research of these type of fortifications followed up: Farkaševac Samoborski in 2001–2003 (Kalafatić 2001; Kušer 2004), probe excavations at the hill fort in Mala Črešnjevica near Pitomača around the present day Orthodox Church of 318 Godly Fathers (which in the Middle Ages was the Church of St. Martin) in 2001 (Tkalčec 2002), Gradić or Turski Brijeg in Torčec near Koprivnica in 2002 and 2003 (Tkalčec 2003; Sekelj Ivančan, Tkalčec 2003; 2004; 2007), hill fort next to the church in Novi Pavljani in 2002 (Jakovljević 2012: 23), Gudovac–Gradina near Bjelovar in 2003–2005 and in 2018 (Tkalčec, Jakovljević 2003; 2005; Jakovljević, Tkalčec 2004; Tkalčec 2005; Jakovljević 2006; 2009: 113–117). Furthermore, during long-term excavations at the fortified church at Crkvari–Sveti Lovro site a segment of a palisade was unearthed in 2006 (Tkalčec 2007a: 22–23, fig. 2; 2012b: 26, fig. 3), rescue excavations at Gradina in Stare Plavnice was conducted in 2008 (Drašković 2009), the older phase of Dubovac renaissance castle was excavated in 2009–2010 (Tkalčec et al. 2011), Gradina in Sveta Ana near Đurđevac in 2010 (Tkalčec 2011), lowland fortification in Kloštar Podravski in 2014 (Čimin 2014: 12–14; 2017), Turčišće–Gradišće near Domašinec in 2014, as already mentioned (Krmpotić et al. 2017), Grubišno Polje–Šuma Obrovi 1 in 2015 (Tkalčec 2016), Mala Peratovica–Šuma Obrovi in 2015 (Tkalčec 2016: 110–112), Lovčić–Slatinsko Brdo – Gradina Turski grad in 2016 (not yet published), Gornji Bogičevci – Sv. Ivan Trnava in 2014–2018 (Ivanušec, Mihaljević 2015: 87–90), Osijek Vojakovački–Mihalj in 2018 (Tkalčec 2019b) and Veliki Zdenci–Crni Lug in 2018 (Tkalčec 2019c).

All these excavated sites provided data on the habitation from the 12th century at the earliest. Large number of them also originated from later periods, from the 14th or 15th centuries. On some sites the continuity from the 13th to the 15th centuries, i.e. the beginning of the 16th century, has been established. Although several older dates have been obtained from radiocarbon analyses, e.g. 11th century at Gradišće in Turčišće near Domašinec, such a situation is interpreted by the so called “old wood effect”, and the beginning of the existence of the site was also determined to be the 12th century (Krmpotić et al. 2011: 10–11, Tab. 1).

On all these sites, archaeological excavations took place on their central plateau, except for the Torčec–Gradić, Veliki Zdenci–Crni Lug and Kloštar Podravski, where archaeological excavations were carried out on the remparts as well. However, in the excavations in 1975 at the site Gamula in park Ribnjak near Cathedral in Zagreb, remains of a palisade have



Fig. 9 Veliki Zdenci – Crni Lug, lowland fortification, remains of the palisade in the rampart of the 13th century and the renewal of the palisade (large post-hole to the right) in the 15th century (photo by: S. Krznar)

been unearthed. According to the author and research manager, the palisade structure at Gamula consisted of two rows of wooden palisades and a central stone-wall, which were joined by the wooden supports of vertically placed logs and made an additional fortification system around the cathedral, probably at the beginning of the 16th century (Vinski Gasparini 1958: 43-46, Figures 3 and 4 and Photos 3 and 4). Another explanation for these remains of a wooden palisade was later proposed by Ž. Demo who suggests that it belongs to the Early Middle Ages (Demo 2007: 30, fuss. 77). Remains of the palisades were also discovered in the excavations of more recent castles of Dubovac and Lukavac, and the ramparts with palisades belong to their older phases, at Dubovac from the 14th century (Tkalčec et al. 2011: 76, fig. 2) and at Lukavec from the 15th century, with remains of a lot of preserved wooden elements (Lolić 2003; Knezović 2006). Plenty of woodwork was preserved at Kloštar Podravski, e.g. mediaeval stronghold *Gorbonok* (Čimin 2017). At Veliki Zdenci–Crni Lug remains of a 13th century rampart and palisade with its renewal in the 15th century were also recognized (Fig. 9).

At Torčec–Gradić remains of a rampart of the older phase of the lowland fortification from the 13th century were found (Sekelj Ivančan, Tkalčec 2004: 95, 96, fig. 10–11) (Fig. 10) as well as those of another one with the palisade from the younger phase of the fortification – the 15th century (Sekelj Ivančan, Tkalčec 2004: 94, fig. 6). Torčec–Gradić also provided the data about the ways of protecting the central plateau from erosion. Furthermore, the remains of a wooden bridge and a series of sharpened collars trusted into the defensive ditch made additional protection of the access to the fort (Fig. 11). Similar defensive wooden structures were found in the ditch around the central elevation of the Gudovac–Gradina lowland fortification (Fig. 12).

More data on the defensible structures of the fortifications was yielded by the excavations of the very central elevations of the fortifications. At Virgrad, the remains of wooden palisades were found at the edges of its circular central plateau. Pit-holes were properly arranged in two rows surrounding the central elevation at its edge, consisting of the inner and outer row of a wooden structure of the palisade (Minichreiter 1970: T. LIV). Wooden palisade at the edge of the central mound was also discovered at Grubišno Polje–Šuma Obrovi 1 fortification dated to the late 15th century, where two large post-holes of a bridge structure were also found (Fig. 13).

The present-day archaeological understanding of the function of all of these types of archaeological sites and the time when they were raised, i.e. in the period between the 12th/13th and 16th century, indicates that these fortifications have served as fortified seats of feudal lords and landlords originating mostly from the middle nobility and, as it seems, in the latest periods of the Middle Ages, even from the minor nobility.

Construction of earthen fortifications was a relatively small effort in comparison to expensive masonry work, especially



Fig. 10 Torčec – Gradić, view on wooden construction of inner rampart of the lowland fortification from the 13th century (Sekelj Ivančan, Tkalčec 2004: 95, fig. 9)



Fig. 11 Torčec – Gradić, view on the wooden bridge remains and wooden constructions in the ditch (photo by: T. Tkalčec)



Fig. 12 Gudovac – Gradina, view of wooden structures in the ditch of the lowland fortifications from the late 15th century (photo by: T. Tkalčec)



Fig. 13 Grubišno Polje – Šuma Obrovi 1, view of a palisade surrounding the main elevation of the fortification from the late 15th century with a large post-hole (down left) of the bridge construction (photo by: T. Tkalčec)

in the regions with lack of natural obstacles or lack of nearby stone resources for masonry work. Their existence may be expected at territories where the surrounding areas were changed by subsequent reconstructions (inner colonisation) and expansions (13th century) and also in the times when danger from outer enemy is actual (15th century, Ottoman incursions). Although many are made of wood, we can still find buildings of solid structure (brick, stone) as well. Yet, their common feature are their elevated mounds with the central fortress, faced with earthen ramparts (possibly with wooden palisades) and a deep defensive moats and ditches.

BIBLIOGRAPHY

- Bobovec, A. 1991, Srednjovjekovni arheološki lokaliteti na području općina Kutina i Garešnica, *Muzejski vjesnik*, Vol. 14, 8–12.
- Bobovec, A. 1994, Plovdin grad – kasnosrednjovjekovno gradište barovitog tipa (Wasserburg), *Muzejski vjesnik*, Vol. 17, 25–29.
- Bobovec, A. 1997, Kasnosrednjovjekovno arheološko nalazište Kraljeva Velika, *Muzejski vjesnik*, Vol. 18/19(1995–1996), 16–18.
- Bobovec, A. 2003, Tragom arheoloških nalazišta Moslavine, in: *Kutina: povijesno-kulturni pregled s identitetom današnjice*, Pasarić, D. (ed.), Kutina, 63–85.
- Bobovec, A., Sekelj Ivančan, T. 1996, Obilazak srednjovjekovnih lokaliteta Kraljeve Velike, Opeke i Međurica, *Obavijesti Hrvatskog arheološkog društva*, Vol. 28/2, 35–38.
- Čimin, R. 2014, Prilagodbe u arhitekturi podravskih utvrđenja, *Podravina*, Vol. 13, no. 26, 5–19.
- Čimin, R. 2017, *Vlastelinstvo Gorbonok*, katalog izložbe, Muzej grada Koprivnice, Koprivnica.
- Demo, Ž. 2007, *Opatovina – tragovi povijesti izgubljeni u sadašnjosti. Rezultati arheoloških iskopavanja pred crkvom svetog Franje u Zagrebu 2002. godine*, Zagreb 2007.
- Drašković, N. 2009, Stare Plavnice – Bjelovar, *Hrvatski arheološki godišnjak*, Vol. 5/2008, 178–179.
- Goss, V. P. 2012, *Registar položaja i spomenika ranije srednjovjekovne umjetnosti u međuriječju Save i Drave*, Zagreb.
- Homen, Z. 1998, Rezultati prve etape arheoloških istraživanja u Glogovnici pokraj Križevaca, *Vjesnik muzealaca i konzervatora Hrvatske*, Vol. 3/4, 22–26.
- Homen, Z. 2000a, Rezultati arheoloških istraživanja tijekom 1998. i 1999. godine u Glogovnici, *Cris – Časopis Povijesnog društva Križevci*, Vol. 2/1, 50–53.
- Homen, Z. 2000b, Glogovnica pokraj Križevaca – rezultati arheoloških istraživanja tijekom 1998. i 1999., *Obavijesti Hrvatskog arheološkog društva*, Vol. 32/1, 80–86.
- Horvat, A. 1954, Obilazak spomenika kulture na području kotara Slavonski Brod, *Vijesti Društva muzejsko-konzervatorskih radnika NR Hrvatske*, Vol. 4, 104–106.
- Ivanušec, R., Mihaljević, M. 2015, Lokaliteti križarskih utvrda Račeša, Cage – Lješnica, Sv. Ivan Trnava (Gornji Bogičevci), *Godišnjak zaštite spomenika kulture*, Vol. 39, 77–93.
- Iveković, D. 1968, Rezultati sondažnih arheoloških istraživanja na području Moslavine, *Zbornik Moslavine*, Vol. 1, 349–378.
- Jakovljević, G. 2006, Gudovac, in: *Stotinu hrvatskih arheoloških lokaliteta*, Durman, A. (ed.), Zagreb, 132–133.
- Jakovljević, G. 2009, Srednjovjekovna konjanička oprema i naoružanje s područja Bilogore, *Opvscvla archaeologica*, Vol. 32, 101–131.
- Jakovljević, G. 2012, *Registar arheoloških nalaza i nalazišta Bjelovarsko-bilogorske županije*, Bjelovar.
- Jakovljević, G., Tkalčec, T. 2004, Srednjovjekovno Gradište Gudovac-Gradina kraj Bjelovara u svjetlu prvih arheoloških istraživanja, *Obavijesti Hrvatskog arheološkog društva*, Vol. 36/3, 148–150.
- Kalafatić, Z. 2001, Arheološko istraživanje tumula u Farkaševcu, *Obavijesti Hrvatskog arheološkog društva*, Vol. 33/3, 132–135.
- Karač, Z. 1991, Gradište Ratkov Dol – Radanovac, srednjovjekovna utvrda kod Đakova, *Obavijesti Hrvatskog arheološkog društva*, Vol. 23/1, 31–34.
- Karač, Z. 1992, Srednjovjekovno gradište Banovac-Podgorje kod Đakova, *Obavijesti Hrvatskog arheološkog društva*, Vol. 24/1, 102–105.
- Karač, Z. 2006, Pauče – Grad (utvrda Poljanska), *Hrvatski arheološki godišnjak*, Vol. 2/2005, 16–19.
- Knezović, I. 2006, Zaštitno arheološko istraživanje Starog grada Lukavca godine 2005., *Obavijesti Hrvatskog arheološkog društva*, Vol. 38/1, 148–155.
- Kovačić, B. 2008, Nedelišće-Gradišće, *Hrvatski arheološki godišnjak*, Vol. 4/2007, 153–155.
- Krmpotić, M., Janeš, A., Sekulić, P. 2017, Gradišće u Turčišću, Međimurje, gradište/mota iz razvijenog srednjeg vijeka, *Portal: godišnjak Hrvatskog restavratskog zavoda*, Vol. 8, 7–19.
- Kušer, Z. 2004, Istraživanje srednjovjekovnog nalazišta u Farkaševcu 2002. i 2003., *Obavijesti Hrvatskog arheološkog društva*, Vol. 36/2, 128–132.
- Lolić, T. 2003, *Zaštitna arheološka istraživanja, Lukavec – katalog izložbe*, Muzej Turopolja, Velika Gorica.
- Lovrenčević, Z. 1985, Srednjovjekovne gradine u podravskoj regiji, *Podravski zbornik* 85, 168–199.
- Lovrenčević, Z. 1990, Srednjovjekovne gradine u Bilogori, in: *Arheološka istraživanja u Podravini i Kalničko-bilogorskoj regiji*, *Izdanja Hrvatskog arheološkog društva*, Vol. 14, Majnarić-Pandžić, N. (ed.), Zagreb, 139–141.
- Marcijuš, B. 2009, Nedelišće-Gradišće, *Hrvatski arheološki godišnjak*, Vol. 5/2008, 193–194.
- Marković, Z. 1980, Bilješke o rekognosciranju arheoloških terena oko Koprivnice i Đurđevca 1979. godine, *Muzejski vjesnik*, Vol. 3, 35–39.
- Marković, Z. 1985, Poljangrad, Javorovac, Koprivnica – pokusno iskapanje srednjovjekovnog naselja, *Arheološki pregled*, Vol. 24, 148–150.
- Minichreiter, K. 1970, Virgrad, Županja - srednjovjekovno gradište, *Arheološki pregled*, Vol. 12, 173–176.
- Pribaković, D. 1956, Neki podaci o gradištima severozapadne Hrvatske, *Vesnik Vojnog muzeja*, Vol. 3, 107–141.
- Registar 1997 - *Registar arheoloških nalaza i nalazišta sjeverozapadne Hrvatske*, drugo izdanje, Muzejsko društvo sjeverozapadne Hrvatske, Bjelovar.
- Salajić, S. 2001, *Arheologija virovitičkog kraja*, Virovitica.
- Sekelj Ivančan, T., Tkalčec, T. 2003, Istraživanje srednjovjekovnog gradišta Torčec – Gradić 2002, *Obavijesti Hrvatskog arheološkog društva*, Vol. 35/1, 143–145.
- Sekelj Ivančan, T., Tkalčec, T. 2004, Arheološko nalazište Torčec-Gradić, *Podravina, Časopis za multidisciplinarna istraživanja*, Vol. 3/6, 71–106.
- Sekelj Ivančan, T., Tkalčec, T. 2007, The Earth and Wood Fortification in the Podravina Region and its Relationship to the Settlement and Cemetery, in: *Ruralia VI, Arts and Crafts in Medieval Rural Environment, Szentendre-Dobogókő, 22-29.09.2005*, Klápšć, J., Sommer, P. (eds.), Turnhout, 39–51.
- Težak-Gregl, T., Vojvoda, P. 1987, Staro Čiče, Gradišće – višeslojno naselje, *Arheološki pregled*, Vol. 27 (1986), 46.

- Tkalčec, T. 2002, Arheološko istraživanje crkve Sv. Martina u Maloj Črešnjevici kraj Pitomače u godini 2001., *Obavijesti Hrvatskog arheološkog društva*, Vol. 34/1, 99–103.
- Tkalčec, T. 2003, Nastavak istraživanja srednjovjekovnog gradišta Torčec–Gradić u 2003. g., *Obavijesti Hrvatskog arheološkog društva*, Vol. 35/3, 117–121.
- Tkalčec, T. 2004, *Srednjovjekovna gradišta u Hrvatskoj*, Master Thesis, Filozofski fakultet Sveučilišta u Zagrebu, Zagreb.
- Tkalčec, T. 2005, Gudovac–Gradina 2004, *Annales Instituti Archaeologici*, Vol. 1, 50–55.
- Tkalčec, T. 2007a, Crkvari – crkva Sv. Lovre u 2006. godini, *Annales Instituti Archaeologici*, Vol. 3, 21–25.
- Tkalčec, T. 2007b, Vojakovački Osijek–Mihalj – srednjovjekovni arheološki kompleks na gornjem toku Glogovnice / Vojakovački Osijek–Mihalj, a Medieval Archaeological Complex on the Upper Course of the Glogovnica, *Prilozi Instituta za arheologiju u Zagrebu*, Vol. 24, 453–472.
- Tkalčec, T. 2011, Probna arheološka istraživanja visinskog gradišta Sveta Ana – Gradina 2010. (Archaeological Trial Excavations of the Hill Fort of Sveta Ana – Gradina 2010), *Annales Instituti Archaeologici*, Vol. 7, 45–49.
- Tkalčec, T. 2012a, Rekognosciranje srednjovjekovnih gradišta na području bilogorskog kraja i Zapadne Slavonije 2011. g. (Field survey of the mediaeval earthen fortifications in Bilogora region and the Western Slavonia during 2011), *Annales Instituti Archaeologici*, Vol. 8, 115–127.
- Tkalčec, T. 2012b, Arheološka istraživanja nalazišta Crkvari – crkva sv. Lovre 2011. godine -Archaeological research of the site Crkvari (St. Lawrence Church in 2011), *Annales Instituti Archaeologici*, Vol. 8, 23–28.
- Tkalčec, T. 2013, Rekognosciranja na području Bjelovarsko-bilogorske i Koprivničko-križevačke županije u 2012. godini (Field surveys in the Bjelovar-Bilogora and Koprivnica-Križevci Counties in 2012), *Annales Instituti Archaeologici*, Vol. 9, 136–166.
- Tkalčec, T. 2016, Kasnosrednjovjekovni arheološki kompleks Grubišno Polje – Šuma Obrovi – probna arheološka istraživanja u 2015. (Late mediaeval complex at Grubišno Polje – Šuma Obrovi – initial archaeological excavations in 2015), *Annales Instituti Archaeologici*, Vol. 12, 99–112.
- Tkalčec, T. 2019a, Small feudal residences in the North-Western Croatia: medieval hill forts and lowland moated fortifications, *Castrum Bene 13, Burg und Dokumentation*, 12. –16. Juni 2013, Krems an der Donau, Österreich, (forthcoming).
- Tkalčec, T. 2019b, Arheološka istraživanja na arheološkome nalazištu Osijek Vojakovački – Mihalj u 2018. godini, *Annales Instituti archaeologici*, Vol. 15, (forthcoming).
- Tkalčec, T. 2019c, Arheološka istraživanja na lokalitetu Veliki Zdenci–Crni Lug 2018. godine, *Annales Instituti archaeologici*, Vol. 15, (forthcoming).
- Tkalčec, T., Jakovljević, G. 2003, Prva sezona istraživanja srednjovjekovnog gradišta Gudovac–Gradina, *Obavijesti Hrvatskog arheološkog društva*, Vol. 35/2, 85–89.
- Tkalčec, T., Jakovljević, G. 2005, Gudovac–Gradina, *Hrvatski arheološki godišnjak*, Vol. 1/2004, 57–59.
- Tkalčec, T., Karavanić, S., Kudelić, A. 2011, Zaštitna arheološka istraživanja na Starom gradu Dubovcu 2009–2010. (Archaeological Rescue Excavations at Stari Grad Dubovac 2009–2010), *Annales Instituti Archaeologici*, Vol. 7, 74–80.
- Tkalčec, T., Kostešić, I. 2014, Izrada digitalnog modela reljefa arheološkog nalazišta na primjeru Gradine kod Špišić Bukovice (The creation of a digital relief model of an archaeological site on the example of Gradina near Špišić Bukovica), *Annales Instituti Archaeologici*, Vol. 10, 85–94.
- Tkalčec, T., Sekelj Ivančan, T. 2004, Primjeri nizinskih srednjovjekovnih gradišta u središnjoj Hrvatskoj - uloga vode u funkciji obrane, *Hrvatske vode, Časopis za vodno gospodarstvo*, Vol. 12/46, 17–27.
- Tomičić, Ž. 1985a, Gradišće kod Nedelišća – rezultati pokusnih arheoloških istraživanja, *Muzejski vjesnik*, Vol. 8, 61–63.
- Tomičić, Ž. 1985b, Rezultati pokusnih arheoloških istraživanja kraj Dvorišća u Međimurju, *Muzejski vjesnik*, Vol. 8, 63–64.
- Tomičić, Ž. 1990, Srednjovjekovni arheološki izvori u međuriječju Mure i Drave – prikaz rezultata novijih istraživanja, in: *Arheološka istraživanja u Podravini i Kalničko-bilogorskoj regiji, Izdanja Hrvatskog arheološkog društva*, Vol. 14, Majnarić-Pandžić, N. (ed.), Vol. 14, Zagreb, 115–129.
- Tomičić, Ž., Vidović, J. 1985, *Rezultati arheoloških istraživanja u Međimurju 1974–1985.*, Čakovec.
- Vinski Gasparini, K. 1958, Noviji arheološki nalazi s područja grada Zagreb. Arheološka istraživanja na položaju “Gamula” u perivoju Ribnjaka u Zagrebu, *Tkalčićev zbornik*, Vol. II, 35–48, figs. 1–8.
- Vinski, Z. 1949, Prilog poznavanju gradišta s osvrtom na jedan nalaz u Podravini, *Historijski zbornik*, Vol. 2/1–4, 223–241.
- Vinski, Z., Vinski Gasparini, K. 1950, *Gradište u Mr-sunjskom lugu. Prvo iskapanje slavenske utvrde iz ranog srednjeg vijeka u Hrvatskoj*, Zagreb.