Varstvo spomenikov

Journal for the Protection of Monuments

53

Zavod za varstvo kulturne dediščine Slovenije
Institute for the Protection of Cultural Heritage of Slovenia

Revija Varstvo spomenikov je periodična znanstveno-strokovna publikacija Zavoda za varstvo kulturne dediščine Slovenije. Revija izhaja od leta 1948.
Revija Varstvo spomenikov je namenjena širjenju znanstvenih in strokovnih spoznanj in vedenj o varstvu in ohranjanju nepremične kulturne dediščine. Številke praviloma niso tematsko usmerjene. V reviji so objavljeni prispevki različnih znanstvenih ved in disciplin (arheologija, etnologija, umetnostna zgodovina, arhitektura, krajinska arhitektura, konservatorstvo, restavratorstvo ipd.), ki sledijo znanstvenemu in profesionalnemu zanimanju avtorjev za varovanje, raziskovanje in upravljanje kulturne dediščine, mednarodne akte in nacionalno zakonodajo, prostorsko načrtovanje in informatiko na področju spomeniškega varstva, konservatorske študije, zgodovino in doktrino spomeniškega varstva itd.

Varstvo spomenikov (Journal for the Protection of Monuments) is a periodical scientific and professional journal issued by the Institute for the Protection of Cultural Heritage of Slovenia. It has been published since 1948.
The journal's purpose is to disseminate scientific and professional findings and knowledge about the protection and preservation of immovable cultural heritage.
The issues are generally not dedicated to a single topic. In the journal are published articles from various scientific fields (archaeology, ethnology, arts history, architecture, landscape architecture, conservation and restoration, etc.), which follow the scientific and professional interests of authors regarding the protection, research and management of cultural heritage, international legal acts and national legislation, spatial planning, information and computer science in the field of monument protection, conservation studies, history and the doctrines of monument protection, etc.

Varstvo spomenikov

Journal for the Protection of Monuments

53

Zavod za varstvo
kulturne dediščine Slovenije
Institute for the Protection of Cultural Heritage of Slovenia

Izdaja / ***Publisher***:
Zavod za varstvo kulturne dediščine Slovenije / *Institute for the Protection of Cultural Heritage of Slovenia*
Poljanska cesta 40, SI–1000 Ljubljana

Zanj / ***Publishing Executive***: Jernej Hudolin
Uredniški odbor / ***Editorial Board***: dr. Andrej Gaspari, dr. Sonja Ifko, dr. Mojca Marjana Kovač, dr. Robert Peskar, dr. Bojana Rogelj Škafar, mag. Marko Stokin, dr. Marko Špikić, mag. Tamara Trček Pečak, dr. Katharina Zanier, mag. Gorazd Živković
Urednica / ***Editor***: Biserka Ribnikar Vasle
Lektoriranje / ***Slovene Language Editor***: Alenka Kobler
Prevod v angleščino / ***English Translations***: Amidas d.o.o.
Oblikovanje / ***Designed by***: Nuit d.o.o.
Tisk / ***Printing***: Paralele d.o.o.
Naklada / ***Copies***: 600

Naslov uredništva / ***Editorial Office***:
Zavod za varstvo kulturne dediščine Slovenije, Poljanska cesta 40, SI–1000 Ljubljana, E: biserka.ribnikar@zvkds.si

www.zvkds.si/sl/knjiznica/varstvo-spomenikov
www.zvkds.si/en/knjiznica/varstvo-spomenikov-journal-protection-monuments-0

Ljubljana, 2023

ISSN 0350-9494

Kazalo / Index

Predgovor

V letošnji 53. številki revije vam v branje ponujamo pet razprav.

Pomemben dejavnik propadanja kulturne dediščine na prostem je onesnaženost zraka. Če je bilo v drugi polovici prejšnjega stoletja najbolj problematično onesnaženje z žveplovim dioksidom, danes spomenike na prostem ogrožajo predvsem dušikovi oksidi in lebdeči delci. Ana Kroflič, Kristijan Vidović in Eva Menart so izdelali oceno tveganja za območje Slovenije, in sicer za kamnito dediščino iz apnenca. Podatki, ki nam jih predstavljajo v znanstveni razpravi *Onesnaženost zraka v Sloveniji kot tveganje za našo kulturno dediščino*, so neprecenljivi za napovedovanje škode na spomenikih, načrtovanje konservatorsko-restavratorskih posegov in seveda tudi kot priporočila za izdelavo novih standardov onesnaženosti zraka.

Eden od načinov, kako dediščino čim bolj približati obiskovalcem in vsem ljubiteljem, je tudi 3D-rekonstrukcija. V ta namen je bila po naročilu Turističnega združenja Izola leta 2021 izdelana 3D-rekonstrukcija rimske obmorske vile v Simonovem zalivu. Katharina Zanier nam v drugi znanstveni razpravi *Simonov zaliv (Izola): poskusna digitalna 3D-rekonstrukcija rimske obmorske vile* predstavi kompleksnost raziskav in odločitev, ki so botrovale izdelavi 3D rekonstrukcije teh najbolje ohranjenih in raziskanih ostankov rimske obmorske vile v Sloveniji.

Kar so ljudje v stoletjih in tisočletjih ustvarili, so v stoletjih in tisočletjih vojskovanja tudi uničevali. Poleg onesnaženja, naravnih katastrof, nekontrolirane urbanizacije in turizma so oboroženi spopadi še vedno ena izmed glavnih groženj kulturni dediščini. In uničevanje spomenikov v vojnah se dogaja tudi v 21. stoletju, kljub mednarodnim konvencijam, kodeksom in dogovorom. V članku *Varovanje kulturne dediščine v času oboroženih konfliktov* Rok Filipčič podaja zgodovino pravne zaščite kulturne dediščine in nam na primerih pokaže, do kod seže njihova zaščita in kako učinkoviti oziroma neučinkoviti so vzvodi za njeno varovanje.

Katarina Udovč v članku *Nižinska poselitev iz starejše železne dobe v Mačkovcu pri Novem mestu* na novo ovrednoti arheološko najdišče, ki je bilo s predhodnimi arheološkimi raziskavami odkrito v letih 1999 in 2006. V drugem članku *Prezentacija taborskega obzidja pri cerkvi sv. Kancijana in tovarišev v Mirni Peči* avtorica poda kronologijo arheoloških posegov pri odkritju protiturškega tabora in razloge za njegovo prezentacijo *in situ*.

V poglavju *Predstavitve* se lahko ozremo nazaj, na delček zgodovine restavratorstva v Sloveniji. Lucija Stepančič je ob njegovi 90-letnici obiskala prof. Franca Kokalja, dolgoletnega dekana Akademije za likovno umetnost in ustanovitelja Oddelka za restavratorstvo. Nastal je iskriv intervju, ki pa nas popelje tudi v prihodnost. Kot ugotavlja prof. Kokalj, izumira ogromno našega znanja, in prav temu so posvečeni tudi letošnji Dnevi evropske kulturne dediščine.

V spomin se tokrat poklanjamo dr. Marijanu Slabetu, arheologu, konservatorju in nekdanjemu direktorju takratnega republiškega zavoda za varovanje naravne in kulturne dediščine. O njegovem bogatem in široko zastavljenem delovanju piše mag. Gojko Zupan.

Tik pred izidom revije pa nas je presenetila žalostna vest, da nas je zapustil dolgoletni sodelavec mag. Miran Erič. V zapisu se ga spominja njegov kolega dr. Andrej Gaspari.

Vabljeni k branju.

Biserka Ribnikar Vasle, urednica

Foreword

This year's 53rd issue of the journal includes five papers for your reading pleasure.

Air pollution is an important factor in the deterioration of outdoor cultural heritage. If in the second half of the last century it was sulfur dioxide pollution that was the most problematic, today it is nitrogen oxides and, above all, particulate matter that are threatening outdoor monuments. Ana Kroflič, Kristijan Vidović and Eva Menart have conducted a risk assessment for Slovenia, focusing on limestone heritage. The data they present in their paper "Air pollution in Slovenia as a risk to our cultural heritage" are extremely valuable for predicting damage to monuments, planning conservation-restoration interventions and, of course, as recommendations for drawing up new air pollution standards.

One of the ways to bring heritage as close as possible to visitors and other heritage lovers is through 3D reconstructions. Aware of this, the Izola Tourism Association commissioned a digital 3D reconstruction of a Roman *villa maritima* at Simonov Zaliv in 2021. In the second paper in this issue, "Simonov Zaliv (Izola): Attempted digital 3D reconstruction of a Roman *villa maritima*", Katharina Zanier presents the complexity of the investigations and the decisions that led to the creation of a 3D reconstruction of the best preserved and most thoroughly investigated remains of a Roman *villa maritima* in Slovenia.

What people have created over the course of centuries and millennia, they have also destroyed through centuries and millennia of warfare. Alongside pollution, natural disasters, uncontrolled urbanisation and tourism, armed conflicts are still one of the principal threats to cultural heritage. And the destruction of monuments in wars is still taking place in the twenty-first century, despite international conventions, codes and agreements. In his paper "Protection of cultural heritage in times of armed conflict", Rok Filipčič sets out the history of the legal protection of cultural heritage and illustrates, through examples, how far this protection reaches and how effective or otherwise the mechanisms for the protection of heritage actually are.

In her paper "Early Iron Age lowland settlement at Mačkovec near Novo Mesto", Katarina Udovč offers a re-evaluation of an archaeological site that was discovered through preliminary archaeological investigations in 1999 and 2006. In her second paper, "Presentation of the tabor wall around the Church of St Cantianus and Companions in Mirna Peč", the same author offers a chronology of the archaeological interventions connected with the discovery of the tabor (a refuge for the local population during Ottoman raids) and sets out the reasons behind the decision to present it *in situ*.

The Presentations section offers us an opportunity to look back at a little piece of the history of restoration in Slovenia. Lucija Stepančič visited Professor Franc Kokalj, for many years the Dean of the Academy of Fine Arts and the founder of the Restoration Department, on the occasion of his 90th birthday. The result was a scintillating interview that also points us towards the future. As Professor Kokalj points out, a great amount of knowledge is in danger of dying out. This is a subject that also ties into the theme of this year's European Heritage Days.

Finally, in this issue we remember Dr Marijan Slabe: archaeologist, conservator and former director of the Republic Institute for the Protection of Natural and Cultural Heritage. Gojko Zupan writes about his diverse and wide-ranging activities.

Shortly before the publication of this issue, we received the sad news of the passing of Mag. Miran Erič, for many years a coworker at the Institute for the Protection of Cultural Heritage of Slovenia. He is remembered in an article by his colleague Dr Andrej Gaspari.

We hope you enjoy reading this latest issue of the journal.

Biserka Ribnikar Vasle, Editor

Ana Kroflič, Kristijan Vidović, Eva Menart

Onesnaženost zraka v Sloveniji kot tveganje za našo kulturno dediščino

Izvirni znanstveni članek
COBISS 1.01

UDK
504.5:719(497.4)
504.5(497.4):719-032.5

Ključne besede: ocena tveganja za Slovenijo, kulturna dediščina na prostem, apnenec, onesnaženost zraka, lebdeči delci (PM)

Izvleček

Predmeti in objekti na prostem, tudi tisti s posebno zgodovinsko in kulturno vrednostjo, so vsakodnevno izpostavljeni vremenskim vplivom in onesnaženemu zraku, zaradi česar bolj ali manj hitro propadajo. Ker bomo z ukrepanjem pri samem izvoru najučinkoviteje pripomogli k varovanju kulturne dediščine, predlagamo ukrepe, kot sta zmanjšanje prometa v mestih ter zaostritev standardov glede kurilnih naprav za kurjenje lesa. Priporočamo tudi ozaveščanje ljudi o škodljivosti nekontroliranega sežiganja bioloških in drugih odpadkov, saj je to pomemben vir lebdečih delcev (PM) v ozračju.

Uvod

Kulturna dediščina je ves čas na preizkušnji – še posebej tista na prostem. Zgodovinske stavbe, kipi in druga nepremična dediščina na prostem so vsakodnevno podvrženi vremenskim vplivom in onesnaženemu zraku, zaradi česar tudi bolj ali manj hitro propadajo. Onesnaženemu zraku so sicer lahko izpostavljeni tudi zgodovinski predmeti, shranjeni znotraj stavb z neurejenim prezračevanjem, a se bomo v tem prispevku namenoma osredotočili na nepremično kulturno dediščino na prostem.

Erozija zaradi vode in vetra je samo eden od možnih vzrokov za izgubo kamnitega materiala na prostem. Naše ozračje je kompleksen večfazni sistem, njegove številne komponente pa vsaka na svoj način interagirajo z izpostavljenimi površinami ter na njih povzročajo nepopravljivo škodo. Tako je na primer že dolgo znano, da onesnaženje zraka z žveplovim dioksidom (SO_2), ki je bilo najbolj problematično v drugi polovici prejšnjega stoletja, pospešuje raztapljanje apnenca oziroma bolje rečeno kalcijevega karbonata ($CaCO_3$, rečemo mu tudi kalcit) na splošno (Cardell-Fernandez et al., 2002). SO_2 se namreč na vlažnih površinah pretvarja v žveplovo(VI) kislino (H_2SO_4), ki povzroča razgradnjo apnenčastega materiala in je med drugim prisotna tudi v kislem dežju. Kalcit je najbolj razširjen mineral na slovenskih tleh in ga najdemo v številnih kamninah, kot sta na primer marmor in lehnjak, prav onesnaženje s SO_2 pa je bilo do nedavnega prepoznano kot glavni vzrok propadanja apnenčaste dediščine na prostem. Stanje se je v zadnjih dveh desetletjih bistveno spremenilo – zaradi globalnega napora, da bi kar se da zmanjšali izpuste SO_2, so danes v ospredju druga onesnaževala, kot so dušikovi oksidi (NO_y) in predvsem lebdeči delci (PM, angl. *particulate matter*) (Di Turo et al., 2016; Kucera, 2005). Njihovi vplivi na staranje oz. propadanje materialov še niso dobro raziskani.
Škodljiv vpliv okolja na kulturno dediščino je odvisen od različnih dejavnikov, ki delujejo bodisi samostojno bodisi v

dr. Ana Kroflič, Kemijski inštitut, ana.kroflic@ki.si
dr. Kristijan Vidović, Kemijski inštitut, kristijan.vidovic@ki.si
dr. Eva Menart, Narodni muzej Slovenije, eva.menart@nms.si

kombinaciji z drugimi dejavniki, in od materiala, iz katerega je predmet izdelan oz. zgrajen. Da bi lahko predvideli, kakšna usoda čaka posamezne predmete in objekte kulturne dediščine v njihovem okolju, in načrtovali kar najučinkovitejše konserviranje-restavriranje, upoštevajoč tako stroške kot škodo, ki jo s tem lahko povzročimo, so v okviru Konvencije o onesnaževanju zraka (CLRTAP, angl. *Convention on Long-Range Transboundary Air Pollution*) leta 1985 zagnali Mednarodni program o vplivih na materiale (ICP-Materials, angl. *International Cooperative Programme on Effects of Air Pollution on Materials*). Pod okriljem tega programa, ki še vedno poteka, so do danes proučevali predvsem vpliv onesnaženja zraka na različne materiale in izpeljali tako imenovane funkcije odziva na odmerek (angl. *dose-response functions*), ki nam služijo za izdelavo ocen tveganja, napovedovanje škode, planiranje konservatorsko-restavratorskih posegov ter ne nazadnje za postavljanje novih, strožjih standardov onesnaženosti zraka (Tidblad et al., 2012). Te funkcije nam omogočajo tudi izdelavo zemljevidov z območji največjega tveganja (Bonazza et al., 2009; de la Fuente et al., 2013), česar pa vsaj po našem vedenju specifično za Slovenijo ni naredil še nihče.
V nadaljevanju se bomo osredotočili na kamnito kulturno dediščino in s pomočjo obstoječih funkcij odziva na odmerek ter dostopnih podatkov o onesnaženosti zraka izdelali oceno tveganja za slovensko ozemlje.

Teoretični modeli

Na tem mestu je v povezavi z vplivom onesnaževal iz zraka na kulturno dediščino na prostem nujno definirati dva pojma – in sicer sta to korozija in t. i. črnenje površin (angl. *soiling*). Pri koroziji gre za izgubo materiala s površine predmeta obravnave zaradi kemijskega napada agresivnih onesnaževal, medtem ko je črnenje površin izključno posledica odlaganja lebdečih delcev iz zraka na (svetla) pročelja stavb in kamnitih spomenikov, brez kakršnekoli kemijske reakcije (Vidal et al., 2019). Ker oba procesa vsak na svoj način povzročata škodo na naši dediščini, bomo v nadaljevanju obravnavali vsakega posebej.

Črnenje površin ali *soiling*

Črnenje izpostavljenih površin zaradi odlaganja lebdečih delcev iz ozračja lahko izmerimo s spremembo reflektance[1] površine in odpravimo s čiščenjem, spiranjem ali barvanjem (Watt et al., 2008). Črnenje (angl. *soiling*) pogosto narobe enačimo z nastankom t. i. črnih skorij (angl. *black crust*), pri katerih gre za kompleksnejši mehanizem nastanka, ki vključuje tako proces korozije kot črnenja in je povezan s specifičnimi vremenskimi razmerami. Črnih skorij zaradi jasnosti njihovega nastanka tu ne bomo obravnavali.
Prvi poskus razvoja funkcij odziva na odmerek za črnenje materialov nacionalnega pomena pod vplivom zračnega onesnaženja z lebdečimi delci je bil narejen v sklopu projekta MULTI-ASSESS. Za apnenec je empirično pridobljena funkcija v pretežno modernih urbanih okoljih, sicer obremenjena s precejšnjim sipanjem podatkov, naslednja (Kucera, 2005):

$$\Delta R = R_0 \, [1 - \exp(-PM_{10} \times 6{,}5 \times 10^{-6} \times t)].$$

Enačba 1

ΔR je razlika v reflektanci med izpostavljeno (z naloženimi delci) in čisto površino kamna, R_0 je reflektanca čiste površine kamna, PM_{10} je zračna koncentracija lebdečih delcev s premerom, manjšim od 10 µm v µg/m^3, t pa čas izpostavljenosti v dnevih. Ta funkcija sicer izhaja iz osnovnega eksponentnega razmerja, ki se pogosto uporablja za opisovanje odlaganja delcev na površine (Watt et al., 2008):

$$R = R_0 \exp(-K \times t),$$

Enačba 2

kjer je R reflektanca izpostavljene površine z naloženimi delci, $K = \lambda \times PM_{10}$ konstanta črnenja (angl. *soiling constant*), λ pa konstanta odziva na odmerek (angl. *dose-response constant*). λ za polikarbonatno membrano, ki se uporablja kot modelna površina za vrednotenje hitrosti odlaganja delcev iz zraka, znaša $3{,}47 \times 10^{-6}$ in jo lahko uporabimo za oceno črnenja materialov, za katere odvisnost odziva na odmerek ni ovrednotena.

Izguba materiala

V primerjavi s preteklim stoletjem, ko je med uničujočimi učinki na kulturno dediščino daleč prevladovalo onesnaženje s SO_2, je danes, kot rečeno, stanje bistveno drugačno. Več različnih onesnaževal ima namreč primerljiv vpliv na izgubo površinskega materiala zaradi onesnaženja zraka, in sicer odvisno od izvora in stopnje onesnaženja na določenem območju (angl. *multi-pollutant situation*).
Za apnenec so v okviru projekta MULTI-ASSESS empirično razvili naslednjo funkcijo odziva na odmerek (Kucera et al., 2007):

$$R = 3{,}1 + t\,(0{,}85 + 0{,}0059[SO_2]RH_{60} + 0{,}054\text{Padavine}[H^+] + 0{,}078[HNO_3]RH_{60} + 0{,}0258PM_{10}),$$

Enačba 3

kjer se R nanaša na izgubljeni material s površine (v µm), t pa se podaja v letih. $[SO_2]$, $[HNO_3]$ in PM_{10} so koncentracije onesnaževal v zraku v µg/m^3, RH_{60} je relativna zračna vlaga nad 60 % ($RH_{60} = RH - 60$, če je $RH > 60$ %, sicer $RH_{60} = 0$), Padavine in $[H^+]$ pa količina padavin v mm in koncentracija H^+ v mg/l, izračunana iz pH deževnice. $[HNO_3]$ lahko izmerimo ali izračunamo (Kucera, 2005).

$$[HNO_3] = 516 \times \exp(-3400 / (T + 273) \times ([NO_2] \times [O_3] \times RH)^{0{,}5}$$

Enačba 4

$[NO_2]$ in $[O_3]$ sta koncentraciji dušikovega dioksida (NO_2) in ozona (O_3) v zraku (v µg/m^3), T pa temperatura v °C. Kot je razvidno iz enačbe 3, na hitrost propadanja apnenčastih objektov z izgubo materiala s površin vplivajo:

1) suha depozicija[2] SO_2 v prisotnosti vlage, ki vodi do pretvorbe $CaCO_3$ v $CaSO_4 \cdot 2H_2O$ (gips), ta pa je bistveno bolj vodotopen in ga dež lažje izpere,
2) kisli dež zaradi raztopljenih antropogenih kislin, H_2SO_4 in HNO_3, pri čemer pride na površini kamna do nevtralizacije s $CaCO_3$, kar pospeši raztapljanje apnenca,
3) suha depozicija HNO_3(g) v prisotnosti vlage, ki je posledica onesnaženja zraka z NO_2 in O_3 in prav tako vodi do raztapljanja $CaCO_3$ zaradi pretvorbe v bolj topen $Ca(NO_3)_2$, ter
4) odlaganje PM_{10}, ki tudi kemijsko interagira z apnencem, a natančni mehanizmi zaradi izjemno kompleksne sestave lebdečih delcev številnih izvorov še niso poznani.

Metode dela

Da bi ocenili, kakšno tveganje predstavlja onesnažen zrak za slovensko kulturno dediščino na prostem, smo od Agencije Republike Slovenije za okolje (ARSO) pridobili podatke o onesnaženosti zraka po različnih krajih v Sloveniji (ARSO, 2015–2019). Dodatno smo podatke o koncentracijah PM_{10} in potrebne meteorološke podatke pridobili s spletnih strani ARSO (ARSO, 2015–2020; ARSO METEO, 2021). Podatki za leto 2019 so zbrani v preglednici 1.
Dostopne podatke državne merilne mreže za meritve kakovosti zraka in padavin smo uporabili za izračun funkcij odziva na odmerek, ki so predstavljene v prejšnjem poglavju, in nato za vrednotenje škode, ki jo v slovenskih mestih predvidoma povzroči onesnažen zrak na apnenčastih objektih. Žal podobne funkcije za druge relevantne kamnite materiale ne obstajajo.
Na tem mestu je treba tudi poudariti, da sta obe funkciji odziva na odmerek, ki smo ju uporabili, sicer primerni za razvita mestna središča, kot smo jih obravnavali v tem delu, a so funkcijo za črnenje površin razvili na osnovi omejenega niza podatkov, zaradi česar je pri interpretaciji rezultatov potrebna določena previdnost. Med drugim je vprašljiva ekstrapolacija rezultatov na daljša časovna obdobja ($\Delta R / R_0 > 50$ %), v posameznih primerih pa bi bilo bolje uporabiti celo modificirano eksponentno funkcijo z asimptotično vrednostjo. Več v Watt in sodelavci (Watt et al., 2008).

	$[SO_2]$	RH (%)	Padavine (mm)	pH	T (°C)	$[NO_2]$	$[O_3]$	PM_{10}
LJ	4	74	1378,9	5,25	12,2	25	44	22
MB	4*	74	1023,6	5,3*	11,9	25	54	22
KR	4*	80	1315	5,3*	10,5	25*	54*	19
KO	4*	71	1145,1	5,3*	14,7	15	70	20
CE	4	78	1216,6	5,3*	11,3	25	44	22
NM	4*	78	1209,3	5,3*	12	25*	54*	20
NG	4*	71	1324,7	5,3*	13,8	26	52	20
MS	4*	75	895	5,39	11,8	13	53	21

*Vrednost ni izmerjena, ampak predpostavljena glede na druge dostopne podatke.
Preglednica 1: Meteorološki podatki in podatki onesnaženja zraka za leto 2019. Koncentracije onesnaževal so podane v µg/m^3.

1 Reflektanca ali odbojnost površine je delež vpadne svetlobe, ki se odbije od površine.

2 Suha depozicija je prosto posedanje običajno plinov, ki ni odvisno od padavin.

Enačba 3 prav tako ne vsebuje člena za vpliv kloridnih ionov, ki so tipični za morske aerosole in še posebej agresivni do kovin (Kucera, 2005). Ker kloridi vplivajo na fizikalne in kemijske lastnosti aerosolov (npr. higroskopičnost), lahko tako še dodatno povečajo škodljiv vpliv PM na kulturno dediščino (Wang et al., 2017).

Opredelitev raziskovalnega področja

Podatki o onesnaženosti zraka so bili na voljo za naslednje lokacije (v oklepaju je pripisano število prebivalcev): LJ – Ljubljana Bežigrad (295.504), MB – Maribor (112.682), KR – Kranj (57.065), KO – Koper (52.630), CE – Celje (49.540), NM – Novo mesto (37.587), NG – Nova Gorica (31.884), MS – Murska Sobota (18.758), Iskrba (13). Večina merilnih mest se uvršča v mestni tip ozadja, MS in Iskrba pa se klasificirata za obmestno in podeželsko ozadje. Slovenija je sicer glede na kakovost zunanjega zraka razdeljena na dve aglomeraciji (LJ in MB) ter štiri območja: SI1 (MS), SI2 (CE), SI3 (KR, NM) in SI4 (KO, NG).

Na kakovost zraka v Sloveniji vplivajo tako emisije v zrak v državi sami kot tudi transport onesnaženega zraka preko naših meja. Glavni viri onesnaženega zraka s PM_{10} so tako promet, kurjenje lesne biomase in sekundarni aerosoli (to so zračne mase, ki prinesejo starane PM delce od drugod in lahko prepotujejo velike razdalje). Poleg tega na lokalne koncentracije onesnaževal v zraku pomembno vplivajo še drugi dejavniki, kot so posamezne veje industrije in intenzivna kmetijska dejavnost, vreme, značilnosti terena in specifični meteorološki pojavi (na primer temperaturna inverzija, ki je v Sloveniji značilen pojav).

Rezultati in diskusija

Vpliv PM_{10} na črnenje površin

Črnenje apnenčastih površin smo napovedali z uporabo enačbe 1, in sicer po naslednjih dveh scenarijih (vsakokrat za 15-letno obdobje):

A. ocena za nazaj – za izračun smo uporabili povprečno letno koncentracijo PM_{10} v letih od 2015 do 2019 in
B. napoved za naprej – za izračun smo uporabili povprečno letno koncentracijo PM_{10} v letu 2020.

V Sloveniji se obremenjenost ozračja s PM zadnja leta v grobem zmanjšuje. Enak trend posledično pričakujemo tudi pri hitrosti črnenja površin. Po določenem času je sprememba reflektance po scenariju B res nižja kot po scenariju A, razen za Koper, kjer je bila onesnaženost zraka v letu 2020 primerljiva s predhodnim petletnim obdobjem (slika 1). Če primerjamo zmanjšanje reflektance po 10 letih, so po scenariju B vrednosti za 6,0–19,7 % nižje kot po scenariju A. Najmanjši napredek je v Novi Gorici, takoj za njo pa v Ljubljani, največje izboljšanje kakovosti zraka pa so zabeležili v Celju.

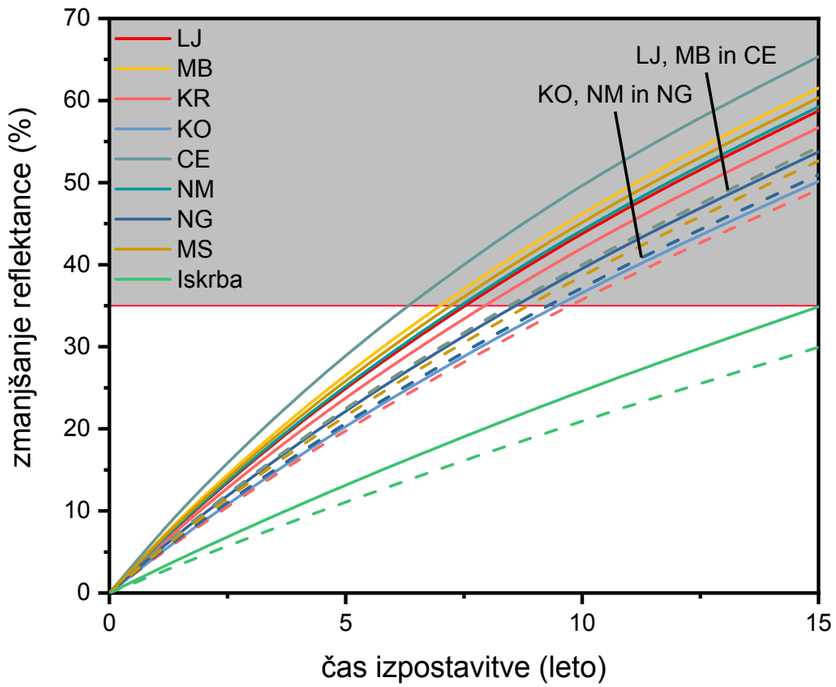
Pa vendar izboljšanje stanja še vedno ni dovolj za splošno oceno ogroženosti apnenčastih spomenikov in zgradb po Sloveniji. Brimblecombe in Grossi (2005) sta proučevala javno mnenje in ocenila, da je za večino ljudi izguba reflektance za 35 % ali več nesprejemljiva; pri tej vrednosti sta postavila mejo, ko se pojavi potreba po čiščenju površine. Če izključimo Iskrbo, kjer gre za podeželsko ozadje, bi po scenariju A apnenčasti objekti v slovenskih mestih potrebovali čiščenje na 6–9 let, po scenariju B, ki ga lahko razumemo kot napovedni model za prihodnost, pa bi bilo smiselno čiščenje organizirati na vsakih 8–9 let.

Pri načrtovanju konservatorsko-restavratorskih posegov je treba poleg subjektivne percepcije estetike upoštevati tudi stroške in morebitno škodo, ki jo pri tem naredimo (izguba originalne površine in predvsem detajlov). Čiščenje kamnite dediščine je tako po nekaterih ocenah sprejemljivo le na vsakih 10–15 let (Watt et al., 2008). Po tem kriteriju se je mesto Kranj z 9,7 leta med zaporednima čiščenjema še najbolj približalo standardu, najbolj problematično pa kljub občutnemu izboljšanju situacije v zadnjem času ostaja Celje s predvidenim 8,5-letnim intervalom. Za primerjavo na sliki 1 prikazujemo tudi primer podeželja (Iskrba), kjer so bile izmerjene povprečne letne koncentracije PM_{10} daleč pod urbanimi (12 in 10 µg/m³ zaporedoma v obdobju 2015–2019 in leta 2020). Za celotno proučevano obdobje lahko zaključimo, da kamniti objekti na tem področju niso prekomerno ogroženi.

Danes so mejne vrednosti za PM določene glede na škodljive učinke na zdravje ljudi, in sicer pri povprečni letni koncentraciji PM_{10} 40 (Uradni list RS, št. 09/11) oziroma 20 µg/m³ (Svetovna zdravstvena organizacija, 2005). Ob upoštevanju zgornjih kriterijev za varovanje kulturne dediščine bi bilo mejno vrednost smiselno postopoma še nekoliko znižati, na 15 µg/m³ (Kucera, 2005). Takšno onesnaženje bi namreč močno olajšalo načrtovanje konservatorsko-restavratorskih posegov, a je bila ta meja v vseh letih in vseh slovenskih mestih presežena.

Vpliv onesnaženosti zraka na izgubo materiala

PM pa, tako kot še nekatera druga onesnaževala, povzroča tudi korozijo in izgubo materiala dediščine na prostem. Zaradi dostopnosti podatkov smo v tem primeru analizirali leto 2019 in primerjali napovedano izgubo materiala s površine s sprejemljivo hitrostjo korozije za apnenec, ki so jo Kucera in sodelavci (2005) definirali pri 8 µm/leto. Rezultati so zbrani v preglednici 2.



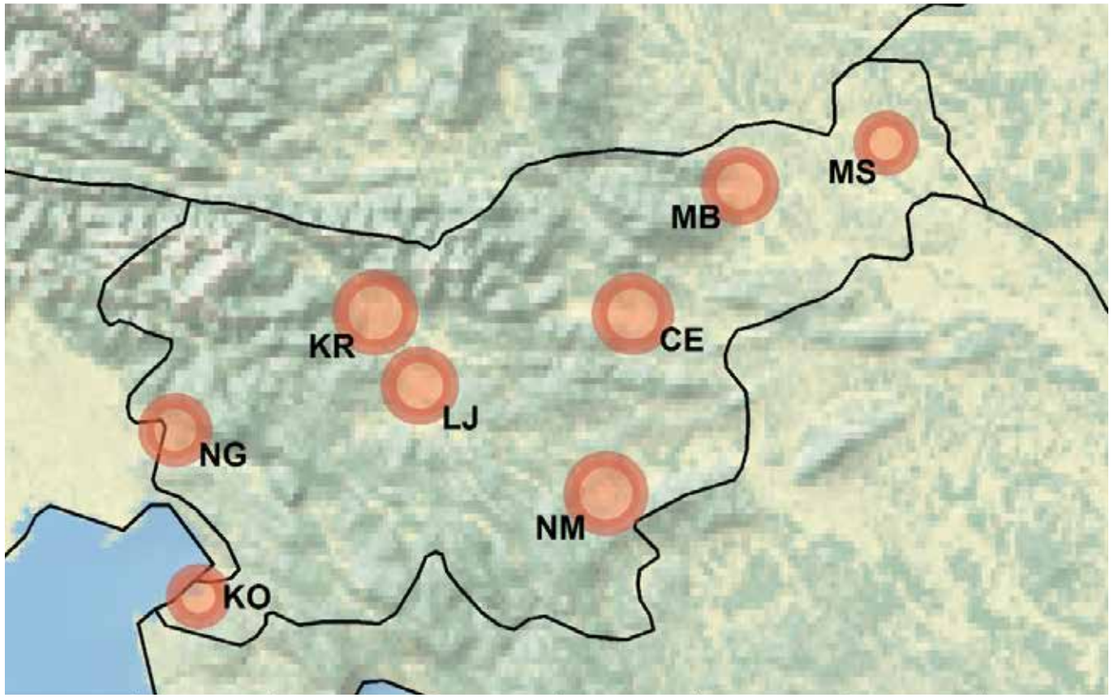
Slika 1: Napoved črnenja površin za slovenska mesta po scenariju A (polne črte) in B (črtkane črte). Z rdečo črto je označena mejna vrednost izgube reflektance pri 35 %.

	R-multi	% PM_{10}	% HNO_3	% Padavine	% SO_2	*R*-PM_{10}
LJ	6,3	9,0	16,9	6,6	5,2	4,5
MB	6,3	9,0	18,6	4,4	5,2	4,5
CE	6,6	8,6	20,5	5,0	6,4	4,5
KR	6,9	7,1	23,7	5,2	6,8	4,4
KO	5,9	8,7	15,0	5,2	4,4	4,5
NM	6,8	7,6	22,9	4,8	6,3	4,5
NG	6,1	8,5	16,1	5,9	4,3	4,5
MS	5,9	9,1	15,1	3,3	6,0	4,5

Preglednica 2: Predvidena izguba materiala (R) v µm/leto za kompleksno sliko onesnaženja, kot je povzeta v preglednici 1 (R-multi), za onesnaženje s PM_{10} v odsotnosti drugih onesnaževal (R-PM_{10}) in vpliv posameznega onesnaževala k R-multi (v %).

Za vsa slovenska mesta, ki smo jih vzeli pod drobnogled, velja, da je napovedana izguba materiala s površine apnenčaste dediščine sprejemljiva (5,9–6,9 µm/leto). Zanimivo je, da smo največjo izgubo napovedali ravno za Kranj, ki ima sicer najboljše razmere z vidika črnenja površin. Na tem mestu je zato pomembno poudariti, da za Kranj ni bilo na voljo vseh potrebnih parametrov onesnaženja zraka, zato smo nekatere predpostavili, to pa je možen vzrok napačne ocene za to lokacijo. Po drugi strani se Koper od drugih lokacij razlikuje po bližini morja, posledica česar je že omenjena prisotnost kloridnih ionov v zračnih aerosolih, tega pa, kot rečeno, pri izračunih nismo upoštevali. Zato je ocenjena izguba materiala zaradi onesnaženosti zraka v Kopru morda podcenjena. Kljub temu da je SO_2 še nedolgo tega veljal za glavnega krivca propadanja kulturne dediščine, danes k izgubi materiala povprečno prispeva zgolj 5,6 % (4,3–6,8 %), kar je primerljivo z vplivom kislega dežja (3,3–6,6 %, v povprečju 5,1 %). Vpliv PM_{10} je nekoliko večji (povprečno 8,5 %), največji vpliv pa ima onesnaženje s hlapi HNO_3 (v povprečju 18,6 %).

V preglednici 2 je izračunana tudi teoretična izguba apnenčastega materiala zaradi vremenskih vplivov in onesnaženja s PM_{10} v odsotnosti vseh drugih onesnaževal. Hitrost korozije bi se v tem primeru zmanjšala le za okoli 30 %.



Slika 2: Ocena tveganja za Slovenijo. Velikost kroga ponazarja raven onesnaženja, ki škoduje kamnitim objektom na določenem območju, in izhaja iz preglednice 2.

Sklep

Izdelali smo oceno tveganja za slovensko kamnito dediščino, specifično za apnenčaste objekte kulturne dediščine. Pri tem smo se osredotočili na dva škodljiva procesa, ki se med seboj bistveno razlikujeta.

K izgubi materiala s površine prispevajo tako vremenski vplivi kot različna onesnaževala iz zraka, ki bodisi delujejo uničujoče samostojno ali v kombinaciji z drugimi onesnaževali. V primeru ohranitve ravni onesnaženja zraka v slovenskih mestih lahko v prihodnje pričakujemo izgubo materiala z apnenčastih površin v rangu 5,9–6,3 µm/leto oziroma 31–41 µm v 10 letih. Zemljevid trenutnega stanja za posamezne lokacije po Sloveniji je prikazan na sliki 2. Takšna dinamika je glede na predhodne študije, objavljene v literaturi, za kulturno dediščino sprejemljiva. Če se naprej osredotočimo na posamezna onesnaževala, je možno doseči največji napredek z omejevanjem koncentracije hlapov HNO_3 v zraku, ki so direktno povezani z izpusti NO_x in ravnjo onesnaženja z O_3 ter s tem s prometom. Po drugi strani onesnaženje s PM_{10} prispeva k uničevanju apnenčaste dediščine s 7,1–9,1 %, na kar lahko vplivamo z zmanjševanjem izpustov iz prometa, pozimi pa še posebej iz kurilnih naprav na lesno biomaso.

Z vidika črnenja spomenikov in pročelij stavb zaradi odlaganja lebdečih delcev iz zraka stanje v slovenskih mestih še ni zadovoljivo, čeprav se izboljšuje. Predlagana mejna povprečna letna koncentracija PM_{10} z namenom varovanja kulturne dediščine je 15 µg/m^3, kar je sicer manj od trenutnih mejnih vrednosti, ki so jih določili regulatorni organi in WHO. Smiselna ukrepa sta tako zmanjšanje prometa v mestih (predvsem omejevanje težkih vozil in (večinoma starejših) vozil s prekomernimi izpusti) ter zaostritev standardov glede kurilnih naprav za kurjenje lesne biomase, ki jih ljudje uporabljamo predvsem v hladnejših jesenskih in spomladanskih mesecih, pa tudi pozimi. Poleg tega predlagamo ozaveščanje ljudi o škodljivosti nekontroliranega sežiganja bioloških in drugih odpadkov v spomladanskih in poletnih mesecih, saj so takšna kurišča na prostem neposreden vir PM, posredno pa vplivajo na nastanek ozona, ki je med drugim prekurzor škodljivega HNO_3.

Zahvala

Avtorji se zahvaljujemo Javni agenciji za raziskovalno dejavnost RS (ARRS) za finančno podporo (programa P1-0034 in P6-0283 in projekt J1-1707 *Vplivi onesnaženja s trdnimi delci (PM) na kulturno dediščino*). Ana Kroflič se zahvaljujem študentki Moniki Ogrizek za pomoč pri slikovnem gradivu.

Viri in literatura

ARSO, 2015–2019. Kakovost zraka v Sloveniji, letno poročilo, Ljubljana. Pridobljeno s http://www.arso.gov.si/zrak/kakovost%20zraka/poro%c4%8dila%20in%20publikacije/kakovost_letna.html.ARSO, 2015–2020. Povprečna mesečna raven delcev PM_{10}. Pridobljeno s http://www.arso.gov.si/zrak/kakovost%20zraka/podatki/.

ARSO METEO, 2021. https://meteo.arso.gov.si/met/sl/appwebmet/#webmet==8Sdwx2bhR2cv0WZ0V2bvEGcw9ydlJWblR3LwVnaz9SYtVmYh9iclFGbt9SaulGdugXbsx3cs9mdl5WahxXYyNGapZXZ8tHZv1WYp5mOnMHbvZXZulWYnwCchJXYtVGdlJnOn0UQQdSf;.

Bonazza, A., Messina, P., Sabbioni, C., Grossi, C. M., Brimblecombe, P., 2009. Mapping the impact of climate change on surface recession of carbonate buildings in Europe. Sci. Total Environ. 407, 2039–2050.

Brimblecombe, P., Grossi, C. M., 2005. Aesthetic thresholds and blackening of stone buildings. Sci. Total Environ. 349, 175–189.

Cardell-Fernandez, C., Vleugels, G., Torfs, K., Van Grieken, R., 2002. The processes dominating Ca dissolution of limestone when exposed to ambient atmospheric conditions as determined by comparing dissolution models. Environ Geol 43, 160–171.

de la Fuente, D., Vega, J. M., Viejo, F., Diaz, I., Morcillo, M., 2013. Mapping air pollution effects on atmospheric degradation of cultural heritage. J Cult Herit 14, 138–145.

Di Turo, F., Proietti, C., Screpanti, A., Fornasier, M. F., Cionni, I., Favero, G., De Marco, A., 2016. Impacts of air pollution on cultural heritage corrosion at European level: what has been achieved and what are the future scenarios. Environ. Pollut. 218, 586–594.

Kucera, V., 2005. MULTI-ASSESS publishable final report. Swedish Corrosion Institute, Stockholm.

Kucera, V., Tidblad, J., Kreislova, K., Knotkova, D., Faller, M., Reiss, D., Snethlage, R., Yates, T., Henriksen, J., Schreiner, M., Melcher, M., Ferm, M., Lefèvre, R.-A., Kobus, J., 2007. UN/ECE ICP Materials Dose-response Functions for the Multi-pollutant Situation, v: Brimblecombe, P., Hara, H., Houle, D., Novak, M. (ur.), Acid Rain - Deposition to Recovery. Springer, Dordrecht.

Svetovna zdravstvena organizacija, 2005. WHO Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide, global update.

Tidblad, J., Kucera, V., Ferm, M., Kreislova, K., Brüggerhoff, S., Doytchinov, S., Screpanti, A., Grøntoft, T., Yates, T., de la Fuente, D., Roots, O., Lombardo, T., Simon, S., Faller, M., Kwiatkowski, L., Kobus, J., Varotsos, C., Tzanis, C., Krage, L., Schreiner, M., Melcher, M., Grancharov, I., Karmanova, N., 2012. Effects of air pollution on materials and cultural heritage: ICP Materials celebrates 25 years of research. International Journal of Corrosion 2012, 496321.Uradni list RS, št. 09/11, Uredba o kakovosti zunanjega zraka.

Vidal, F., Vicente, R., Silva, J. M., 2019. Review of environmental and air pollution impacts on built heritage: 10 questions on corrosion and soiling effects for urban intervention. J Cult Herit 37, 273–295.

Wang, H., Wang, X. F., Yang, X., Li, W. J., Xue, L. K., Wang, T., Chen, J. M., Wang, W. X., 2017. Mixed Chloride Aerosols and their Atmospheric Implications: A Review. Aerosol Air Qual. Res. 17, 878–887.

Watt, J., Jarrett, D., Hamilton, R., 2008. Dose-response functions for the soiling of heritage materials due to air pollution exposure. Sci. Total Environ. 400, 415–424.

Povzetek

Spomeniki, zgradbe in drugi zgodovinski predmeti na prostem so vsakodnevno izpostavljeni vremenskim vplivom in onesnaženemu zraku, zaradi česar bolj ali manj hitro propadajo. Spremljanje spreminjajočih se vremenskih razmer je pomembno z vidika prilagajanja na podnebne spremembe. Z ustrezno oceno tveganja in ob upoštevanju specifičnih parametrov onesnaženega zraka pa lahko aktivno usmerjamo oblikovanje politik zmanjševanja onesnaženja zraka in tako z ukrepanjem pri samem izvoru najučinkoviteje pripomoremo k varovanju naše kulturne dediščine.

V tej študiji smo se osredotočili na kamnito kulturno dediščino na prostem. V tem kontekstu sta pomembna dva procesa staranja kamnitih površin, in sicer korozija in t. i. črnenje površin (angl. *soiling*). Pri koroziji gre za poškodbo površine zaradi kemijskih reakcij, medtem ko je črnenje površin izključno posledica odlaganja lebdečih delcev iz zraka (PM) na svetla pročelja stavb in kamnitih spomenikov. Glede na predhodne študije, objavljene v literaturi, so trenutne razmere v ozračju za slovensko kulturno dediščino sprejemljive, kar pa ne pomeni, da izboljšave niso mogoče.

Na osnovi izdelane ocene tveganja za slovensko kamnito dediščino, specifično za apnenčaste predmete kulturne dediščine, predlagamo predvsem omejevanje koncentracij hlapov HNO_3 in PM_{10} v zunanjem zraku. Pri tem bi bili najbolj smiselni ukrepi, kot so zmanjšanje prometa v mestih, zaostritev standardov glede kurilnih naprav za kurjenje lesa in ozaveščanje ljudi o škodljivosti nekontroliranega sežiganja bioloških in drugih odpadkov.

Ana Kroflič, Kristijan Vidović, Eva Menart

Air pollution in Slovenia as a risk to our cultural heritage

Original scientific article
COBISS 1.01

UDC
504.5:719(497.4)
504.5(497.4):719–032.5

Keywords: risk assessment for Slovenia, outdoor cultural heritage, limestone, air pollution, particulate matter (PM)

Abstract

Outdoor artefacts, including those with special historical and cultural value, are continuously exposed to the weather and air pollution, which causes them to deteriorate at varying rates. Since tackling the problem at its origin is the most effective way to contribute to the protection of cultural heritage, we propose measures such as reducing traffic in cities and the tightening of standards for wood-fired combustion devices. We also recommend raising awareness of the harmfulness of the uncontrolled burning of biological and other waste, since this is an important source of particulate matter (PM) in the atmosphere.

Introduction

Cultural heritage – particularly outdoor heritage – faces constant challenges. Historic buildings, statues and other examples of immovable, outdoor heritage are continuously exposed to the weather and air pollution, which leads to varying rates of deterioration and decay. Historic artefacts stored in buildings with inadequate ventilation can also be exposed to air pollution, but in this paper we are intentionally focusing on immovable cultural heritage located outdoors.

Water and wind erosion are just two of the possible causes of the loss of stone material in outdoor contexts. Our atmosphere is a complex multiphase system and each of its numerous components interacts with exposed surfaces in its own way, causing irreparable damage to them. It has long been known, for example, that sulfur dioxide (SO_2), which was most problematic in the second half of the last century, accelerates the dissolution of limestone or, rather, calcium carbonate ($CaCO_3$; also referred to as calcite) in general (Cardell-Fernandez et al., 2002). On wet surfaces, SO_2 is converted into sulfuric acid (H_2SO_4), which is also present in acid rain and which causes the decomposition of carbonate materials. Calcite is the most widespread mineral in Slovenia and is found in numerous types of rock, such as marble and tufa, while until recently SO_2 pollution was the main cause of deterioration of outdoor limestone heritage. The situation has changed significantly in the last two decades. Thanks to global efforts to reduce SO_2 emissions, the focus today is on other pollutants such as nitrogen oxides (NO_y) and, especially, particulate matter (PM) (Di Turo et al., 2016; Kucera, 2005). Their effects on the ageing or decay of materials are still not yet well understood.

Harmful environmental impacts on cultural heritage are dependent on various factors, acting either independently or in combination with other factors, and on the material from which the artefact is made. In order to enable us to predict the fate of individual cultural heritage artefacts in their environment and plan the most effective conservation-restoration measures, taking into account

Ana Kroflič PhD, Research Assistant Professor, National Institute of Chemistry, ana.kroflic@ki.si
Kristijan Vidović PhD, Postdoctoral Research Associate, National Institute of Chemistry, kristijan.vidovic@ki.si
Eva Menart PhD, Research Associate, National Museum of Slovenia, eva.menart@nms.si

both costs and the damage that this could cause, the International Cooperative Programme on Effects of Air Pollution on Materials (ICP-Materials) was launched in 1985 within the context of the Convention on Long-Range Transboundary Air Pollution (CLRTAP). Under this programme, which is still operating today, the effects of air pollution on various materials have been studied and dose-response functions derived. The latter enable us to make risk assessments, predict damage, plan conservation-restoration interventions and, last but not least, introduce new, stricter air pollution standards (Tidblad et al., 2012). They also allow us to draw up maps showing the areas of greatest risk (Bonazza et al., 2009; de la Fuente et al., 2013), something that as far as we are aware has not yet been done for the specific case of Slovenia.
Below we will focus on stone cultural heritage and, with the help of existing dose-response functions and available air pollution data, carry out a risk assessment for the territory of Slovenia.

Theoretical models

At this point it is essential to define two terms related to the effect of atmospheric pollutants on outdoor cultural heritage. These are corrosion and soiling (i.e. the blackening of surfaces). Corrosion refers to the loss of material from the surface of the artefact as a result of chemical attack by aggressive pollutants, while soiling is exclusively the consequence of the deposition of airborne particles on (light-coloured) façades of buildings and stone monuments, without any chemical reaction (Vidal et al., 2019). Since each process causes damage to heritage in its own way, we will address each of them separately below.

Soiling

The blackening of exposed surfaces as a result of the deposition of airborne particles, otherwise known as soiling, can be gauged by measuring the change of surface reflectance[1] and removed by cleaning, washing or painting (Watt et al., 2008). Although soiling is frequently wrongly equated with the formation of black crusts, the latter has a more complex formation mechanism that includes both stone corrosion and soiling and is tied to specific weather conditions. For the sake of clarity, we will not cover the formation of black crusts here.
The first attempt at developing dose-response functions for soiling of materials of national importance as a result of PM pollution was made within the context of the MULTI-ASSESS project. For limestone, the empirically obtained function in predominantly modern urban environments, although affected by considerable scattering of data, is the following (Kucera, 2005):

$$\Delta R = R_0 [1 - \exp(-PM_{10} \times 6.5 \times 10^{-6} \times t)].$$

Equation 1

ΔR is the difference in reflectance between exposed stone surface (loaded with particles) and clean stone surface, R_0 is the reflectance of clean stone surface, PM_{10} is the atmospheric concentration of particles with a diameter of less than 10 µm in µg/m^3, and t is the exposure period in days. This function actually derives from the basic exponential relationship, which is frequently used to describe the deposition of particles on surfaces (Watt et al., 2008):

$$R = R_0 \exp(-K \times t),$$

Equation 2

where R is the reflectance of the exposed surface loaded with particles, $K = \lambda \times PM_{10}$ is the soiling constant and λ is the dose-response constant. In the case of the polycarbonate membrane that is used as a model surface to evaluate the speed of atmospheric particulate deposition, $\lambda = 3.47 \times 10^{-6}$ and can be used to estimate soiling for materials for which dose-response dependence is not evaluated.

Loss of material

Compared to last century, when SO_2 pollution was by far the most dominant form of pollution in terms of destructive effects on cultural heritage, the situation today – as has been noted – is very different. Several different pollutants have a comparable effect on surface recession as a result of air pollution, depending on the origin and level of pollution in a given area (this is known as a multi-pollutant situation).
The following dose-response function has been empirically developed for limestone in the context of the MULTI-ASSESS project (Kucera et al., 2007):

$$R = 3.1 + t\,(0.85 + 0.0059[SO_2]RH_{60} + 0.054\text{Precipitation}[H^+] + 0.078[HNO_3]RH_{60} + 0.0258PM_{10}),$$

Equation 3

where R relates to surface recession (in µm) and t is given in years. $[SO_2]$, $[HNO_3]$ and PM_{10} are concentrations of pollutants in the air in µg/m^3, RH_{60} is relative humidity above 60% (RH_{60} = RH – 60, if RH > 60 %, otherwise RH_{60} = 0), Precipitation and $[H^+]$ are the quantity of precipitation in mm and the concentration of H^+ in mg/l, calculated from the pH of rainwater. $[HNO_3]$ can either be measured or calculated (Kucera, 2005).

1 Reflectance is the measure of the proportion of incident light that is reflected from a surface.

$$[HNO_3] = 516 \times \exp(-3400 / (T + 273) \times ([NO_2] \times [O_3] \times RH)0.5$$

Equation 4

$[NO_2]$ and $[O_3]$ are the concentrations of nitrogen dioxide (NO_2) and ozone (O_3) in the air (in µg/m^3), while T is the temperature in °C. As can be seen from Equation 3, the rate of decay of limestone artefacts through surface recession is affected by:

1) dry deposition[2] of SO_2 in the presence of moisture, which leads to the conversion of $CaCO_3$ into $CaSO_4 \cdot 2H_2O$ (gypsum), which is significantly more water-soluble and more easily washed away by rain,
2) acid rain as a result of dissolved anthropogenic H_2SO_4 and HNO_3, where neutralisation with $CaCO_3$ occurs on the surface of the stone, which accelerates the dissolution of limestone,
3) dry deposition of HNO_3(g) in the presence of moisture, which is the consequence of air pollution with NO_2 and O_3 and likewise leads to dissolution of $CaCO_3$ as a result of its conversion into more soluble $Ca(NO_3)_2$,
4) deposition of PM_{10}, which also interacts chemically with limestone, although the exact mechanisms are still not known owing to the extremely complex composition of particles of multiple origins.

2 Dry deposition is the free settling of (usually) gases, which is not dependent on precipitation.

Methods

In order to estimate the risk to Slovenia's outdoor cultural heritage represented by polluted air, we obtained air pollution data for various locations in Slovenia from the Slovenian Environment Agency (ARSO, 2015–2019). Additionally, we obtained data on PM_{10} concentrations and necessary meteorological data from the Slovenian Environment Agency website (ARSO, 2015–2020; ARSO METEO, 2021). The data for 2019 are presented in Table 1.
We used available data from the national network for air quality and precipitation monitoring to calculate the dose-response functions presented in the previous section and then to evaluate the damage to calcareous artefacts that is likely to be caused by polluted air in locations around Slovenia. Unfortunately, similar functions do not exist for other relevant stone materials.
At this point it should also be emphasised that while both dose-response functions used are suitable for developed urban centres, as covered in this section, the function for soiling of surfaces was developed on the base of a limited data set, for which reason a certain degree of caution is necessary when interpreting the results. One questionable element is the extrapolation of results to longer time periods ($\Delta R / R_0 > 50$ %), while in individual cases it would even be better to use a modified exponential function

	$[SO_2]$	RH (%)	Precipitation (mm)	pH	T (°C)	$[NO_2]$	$[O_3]$	PM_{10}
LJ	4	74	1378,9	5,25	12,2	25	44	22
MB	4*	74	1023,6	5,3*	11,9	25	54	22
KR	4*	80	1315	5,3*	10,5	25*	54*	19
KO	4*	71	1145,1	5,3*	14,7	15	70	20
CE	4	78	1216,6	5,3*	11,3	25	44	22
NM	4*	78	1209,3	5,3*	12	25*	54*	20
NG	4*	71	1324,7	5,3*	13,8	26	52	20
MS	4*	75	895	5,39	11,8	13	53	21

*value not measured but assumed by taking into account other available data
Table 1: Meteorological data and air pollution data for 2019. Concentrations of pollutants are given in µg/m^3.

with an asymptotic value. For more on this, see Watt et al. (2008). Moreover, Equation 3 does not contain a term corresponding to the impact of chloride ions, which are typically found in marine aerosols and are particularly aggressive to metals (Kucera, 2005). Since the presence of chlorides affects the physical and chemical properties of aerosols (e.g. hygroscopicity), this could additionally increase the harmful impact of PM on cultural heritage (Wang et al., 2017).

Definition of the area of research

Air pollution data were available for the following locations (population in brackets): LJ – Ljubljana Bežigrad (295,504), MB – Maribor (112,682), KR – Kranj (57,065), KO – Koper (52,630), CE – Celje (49,540), NM – Novo Mesto (37,587), NG – Nova Gorica (31,884), MS – Murska Sobota (18,758), Iskrba (13). The majority of monitoring sites are of the urban background type, while MS and Iskrba are classed, respectively, as peri-urban and rural backgrounds. With regard to air quality, Slovenia is divided into two agglomerations (LJ and MB) and four regions: SI1 (MS), SI2 (CE), SI3 (KR, NM) and SI4 (KO, NG).

Air quality in Slovenia is affected both by atmospheric emissions in the country itself and by the transport of polluted air masses over the country's borders. The principal sources of PM_{10} air pollution are traffic, combustion of wood biomass and secondary aerosols (these are air masses that carry aged particles from elsewhere and can travel great distances). Additionally, local concentrations of air pollutants are significantly affected by other factors such as individual industries and intensive agricultural activity, weather, characteristics of the terrain and specific meteorological conditions (e.g. temperature inversion, which is a typical phenomenon in Slovenia).

Results and discussion

Effect of PM_{10} on soiling

We predicted the soiling of limestone surfaces using Equation 1, for the following two scenarios (each for a 15-year period):

A. retrospective estimate – for the calculation we used the average annual PM_{10} concentration in the years 2015 to 2019
B. forward forecast – for the calculation we used the average annual PM_{10} concentration in 2020.

The level of PM pollution in Slovenia has, generally speaking, been decreasing in recent years. We therefore expect to see the same trend in the rate of surface soiling. After a certain period, the change in reflectance under scenario B is in fact lower than under scenario A, except for Koper, where air pollution in 2020 was comparable with the preceding five-year period (Fig. 1). If we compare the reduction in reflectance after 10 years, values under scenario B are 6.0–19.7% lower than under scenario A. The smallest progress is recorded in the case of Nova Gorica, immediately followed by Ljubljana, while the biggest improvement in air quality was recorded in Celje.

The improvement in the situation is, however, still not enough for a general risk assessment for limestone monuments and buildings around Slovenia. Brimblecombe and Grossi (2005) looked at public perception of the soiling of historic buildings and found that, for the majority of people, a loss of reflectance of 35% or greater is unacceptable. They took this value as the threshold at which it becomes necessary to clean the surface. If we exclude Iskrba, where the background type is rural, limestone artefacts in Slovenia's cities would require cleaning at intervals of 6–9 years under scenario A, while under scenario B, which may be understood as a prediction model for the future, it would be sensible to organise cleaning at intervals of 8–9 years.

When planning conservation-restoration interventions, it is necessary to take into account, besides the subjective perception of aesthetics, the costs involved and the damage potentially caused by the intervention (loss of original surface and, above all, surface details). According to some estimates, cleaning stone heritage is only acceptable at intervals of 10–15 years (Watt et al., 2008). Under this criterion, the city of Kranj came closest to the standard, with an interval of 9.7 years between successive cleanings, while the most problematic location, despite considerable improvement of the situation in recent years, remains Celje, with an anticipated 8.5-year interval. For the purposes of comparison, Fig. 1 also shows the case of a rural area (Iskrba), where the measured average annual PM_{10} concentrations are far below those for urban areas (12 and 10 µg/m^3 respectively for the period 2015–2019 and for the year 2020). For the period considered as a whole, we can conclude that stone artefacts in this area are not under excessive threat.

Today the limit values for PM are determined with regard to harmful effects on human health and are set at an average annual PM_{10} concentration of 40 µg/m^3 (UL RS 09/11) or 20 µg/m^3 (World Health Organisation, 2005). Taking into account the above criteria for the protection of cultural heritage, it would be sensible to gradually lower the limit value a little further, to 15 µg/m^3 (Kucera, 2005). Such a level of pollution would make the planning of conservation-restoration interventions considerably easier; however, this limit has been exceeded in all years and in all cities in Slovenia.

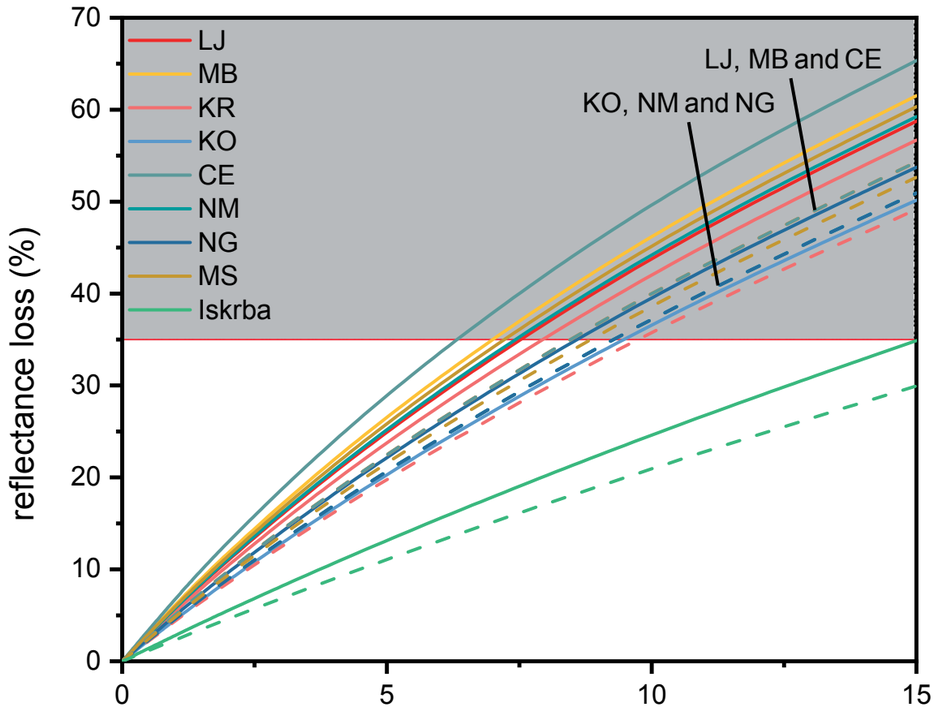


Fig. 1: Soiling forecast for locations in Slovenia under scenario A (continuous lines) and scenario B (dashed lines). The horizontal red line indicates the reflectance loss threshold (35%).

Effect of air pollution on surface recession

PM, like a number of other pollutants, also causes corrosion and surface recession on outdoor heritage. For reasons of data availability, in this case we analysed the year 2019 and compared the predicted surface recession with the tolerable corrosion rate for limestone, defined in the MULTI-ASSESS publishable final report (Kucera, 2005) as 8 µm/year. The results are presented in Table 2.

For all the locations in Slovenia that we examined, predicted surface recession of limestone heritage is at a tolerable level (5.9–6.9 µm/year). Interestingly, the greatest surface recession was predicted for Kranj, which is the location with the best conditions from the point of view of soiling. At this point it should be emphasised that not all the necessary air pollution parameters were available for Kranj. We therefore had to assume some of them, which may mean that the estimate for this location is inaccurate.

Koper, on the other hand, differs from the other locations owing to its proximity to the sea, a consequence of which is the already mentioned presence of chloride ions in atmospheric aerosols, which, however, we did not take into account in the calculations. As a result, surface recession due to air pollution in Koper may be underestimated. Despite the fact that until recently SO_2 was the main culprit behind the deterioration of cultural heritage, today it contributes on average just 5.6% (4.3–6.8%) to surface recession, which is comparable to the effect of acid rain (3.3–6.6%, average 5.1%). The contribution of PM_{10} is slightly higher (average 8.5%), while the biggest effect is caused by nitric acid (HNO_3) pollution (average 18.6 %).

Table 2: Predicted surface recession (R) in µm/year for a complex multi-pollution situation, as summarised in Table 1 (R-multi), for pollution with PM_{10} in the absence of other pollutants (R-PM_{10}) and the contribution of individual pollutants to R-multi (in %).

	R-multi	% PM_{10}	% HNO_3	% Precipitation	% SO_2	*R*-PM_{10}
LJ	6,3	9,0	16,9	6,6	5,2	4,5
MB	6,3	9,0	18,6	4,4	5,2	4,5
CE	6,6	8,6	20,5	5,0	6,4	4,5
KR	6,9	7,1	23,7	5,2	6,8	4,4
KO	5,9	8,7	15,0	5,2	4,4	4,5
NM	6,8	7,6	22,9	4,8	6,3	4,5
NG	6,1	8,5	16,1	5,9	4,3	4,5
MS	5,9	9,1	15,1	3,3	6,0	4,5

Table 2 also shows a calculation of the theoretical loss of limestone material as a result of meteorological conditions and PM_{10} pollution in the absence of all other pollutants. In this case the rate of corrosion would only reduce by around 30%.

Conclusion

We carried out a risk assessment study for stone heritage in Slovenia, specifically for limestone cultural heritage. We focused on two harmful processes that differ significantly from each other.

Both meteorological conditions and various atmospheric pollutants, which have a destructive effect either on their own or in combination with other pollutants, contribute to surface recession. If the level of air pollution in Slovenia's cities remains at its present level, we can expect in the future a loss of material from limestone surfaces in a range of 5.9–6.3 µm/year or 31–41 µm in 10 years. A map of the present situation for individual locations around Slovenia is shown in Fig. 2. Previous published studies in the literature suggest that such a dynamic is acceptable for cultural heritage. If we continue to focus on individual pollutants, it will be possible to achieve the greatest progress by limiting HNO_3 concentrations in the atmosphere. This is directly linked to NOx emissions and the level of pollution with O_3, and thus to traffic. On the other hand, PM_{10} pollution makes a 7.1–9.1% contribution to the destruction of limestone heritage, which we can influence by reducing emissions from traffic and, in winter, from wood biomass-fired combustion devices.

From the point of view of the soiling of monuments and the façades of buildings as a result of the deposition of particles from the air, the situation in cities around Slovenia is still not satisfactory, although it is improving. The proposed limit for the average annual PM_{10} concentration for the purpose of protecting cultural heritage is 15 µm/m^3, which is lower than the current limit values set by regulatory authorities and the WHO. Logical measures thus include reducing traffic in cities (above all restricting access to heavy goods vehicles and (for the most part older) vehicles with excessive emissions) and a tightening of the standards for wood biomass-fired combustion devices, which are mostly used in the cooler autumn and spring months, but also in winter. We also propose raising the population's awareness of the harmful effects of the uncontrolled burning of biological and other waste in spring and summer, since such outdoor combustion is a direct source of PM and also indirectly influences the formation of ozone, which among other things is a precursor of harmful HNO_3.

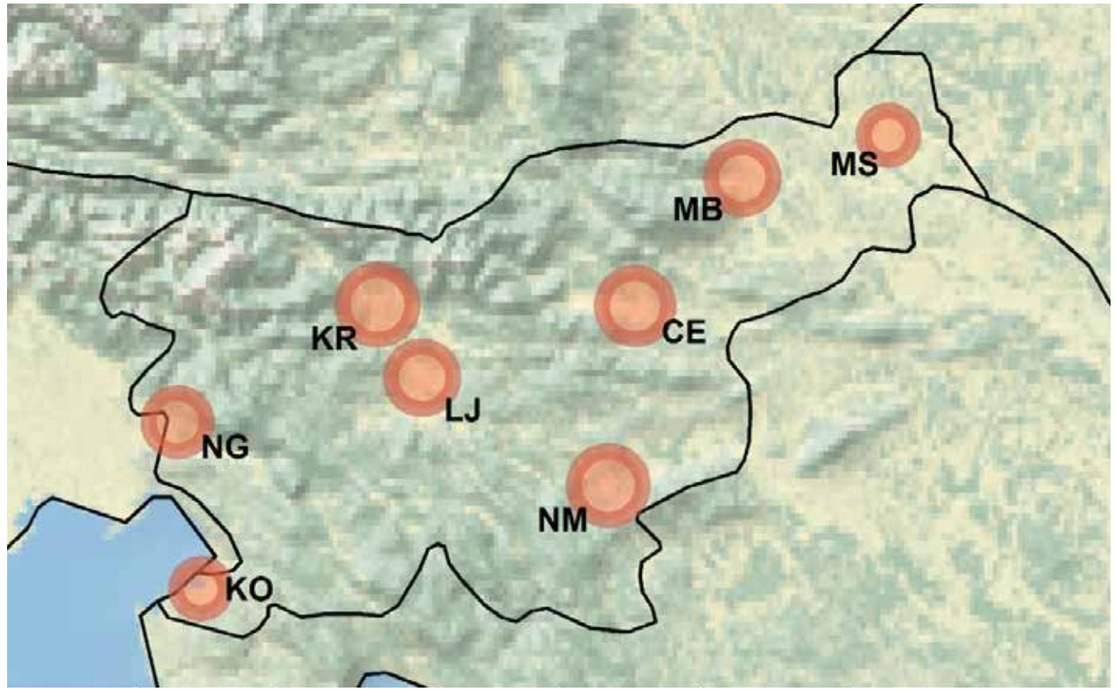


Fig. 2: Risk assessment for Slovenia. The size of the circle illustrates the level of pollution that harms stone artefacts in a given area and derives from Table 2.

Acknowledgements

The authors thank the Slovenian Research Agency (ARRS) for providing financial support (programmes P1-0034 and P6-0283 and project J1-1707 "*Effects of particulate matter (PM) pollution on cultural heritage*"). Ana Kroflič thanks Monika Ogrizek for her assistance with the images (tables and figures) that appear in this text.

References

ARSO, 2015–2019. Air quality in Slovenia, annual report, Ljubljana Retrieved from http://www.arso.gov.si/zrak/kakovost%20zraka/poro%c4%8dila%20in%20publikacije/kakovost_letna.html

ARSO, 2015–2020. Average monthly level of PM_{10}. Retrieved from http://www.arso.gov.si/zrak/kakovost%20zraka/podatki/

ARSO METEO, 2021. https://meteo.arso.gov.si/met/sl/app/webmet/#webmet==8Sdwx2bhR2cv0WZ0V2bvEGcw9ydlJWblR3LwVnaz9SYtVmYh9iclFGbt9SaulGdugXbsx3cs9mdl5WahxXYyNGapZXZ8tHZv1WYp5mOnMHbvZXZulWYnwCchJXYtVGdlJnOn0UQQdSf;.

Bonazza, A., Messina, P., Sabbioni, C., Grossi, C.M., Brimblecombe, P., 2009. Mapping the impact of climate change on surface recession of carbonate buildings in Europe. Sci. Total Environ. 407, 2039–2050.

Brimblecombe, P., Grossi, C.M., 2005. Aesthetic thresholds and blackening of stone buildings. Sci. Total Environ. 349, 175–189.

Cardell-Fernandez, C., Vleugels, G., Torfs, K., Van Grieken, R., 2002. The processes dominating Ca dissolution of limestone when exposed to ambient atmospheric conditions as determined by comparing dissolution models. Environ Geol 43, 160–171.

De la Fuente, D., Vega, J.M., Viejo, F., Diaz, I., Morcillo, M., 2013. Mapping air pollution effects on atmospheric degradation of cultural heritage. J Cult Herit 14, 138–145.

Di Turo, F., Proietti, C., Screpanti, A., Fornasier, M.F., Cionni, I., Favero, G., De Marco, A., 2016. Impacts of air pollution on cultural heritage corrosion at European level: what has been achieved and what are the future scenarios. Environ. Pollut. 218, 586–594.

Kucera, V., 2005. MULTI-ASSESS publishable final report. Swedish Corrosion Institute, Stockholm.

Kucera, V., Tidblad, J., Kreislova, K., Knotkova, D., Faller, M., Reiss, D., Snethlage, R., Yates, T., Henriksen, J., Schreiner, M., Melcher, M., Ferm, M., Lefèvre, R.-A., Kobus, J., 2007. UN/ECE ICP Materials Dose-response Functions for the Multi-pollutant Situation, in: Brimblecombe, P., Hara, H., Houle, D., Novak, M. (eds), Acid Rain – Deposition to Recovery. Springer, Dordrecht.

World Health Organisation, 2005. WHO Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide, global update.

Tidblad, J., Kucera, V., Ferm, M., Kreislova, K., Brüggerhoff, S., Doytchinov, S., Screpanti, A., Grøntoft, T., Yates, T., de la Fuente, D., Roots, O., Lombardo, T., Simon, S., Faller, M., Kwiatkowski, L., Kobus, J., Varotsos, C., Tzanis, C., Krage, L., Schreiner, M., Melcher, M., Grancharov, I., Karmanova, N., 2012. Effects of air pollution on materials and cultural heritage: ICP Materials celebrates 25 years of research. International Journal of Corrosion 2012, 496321.

Uradni list Republike Slovenije [UL RS; official journal] 09/11, Decree on outdoor air quality.

Vidal, F., Vicente, R., Silva, J.M., 2019. Review of environmental and air pollution impacts on built heritage: 10 questions on corrosion and soiling effects for urban intervention. J Cult Herit 37, 273–295.

Wang, H., Wang, X.F., Yang, X., Li, W.J., Xue, L.K., Wang, T., Chen, J.M., Wang, W.X., 2017. Mixed Chloride Aerosols and their Atmospheric Implications: A Review. Aerosol Air Qual. Res. 17, 878–887.

Watt, J., Jarrett, D., Hamilton, R., 2008. Dose-response functions for the soiling of heritage materials due to air pollution exposure. Sci. Total Environ. 400, 415–424.

Summary

Monuments, buildings and other historic outdoor artefacts are continuously exposed to the weather and air pollution, which causes them to deteriorate at varying rates. Monitoring changing atmospheric conditions is important from the point of view of adaptation to climate change. With a suitable risk assessment, and taking into account the specific parameters of polluted air, we can actively orient the formulation of policies aimed at reducing air pollution and in this way, by tackling the problem at its origin, make the most effective contribution to protecting our cultural heritage.

In this study we have focused on outdoor stone cultural heritage. Two processes that are important in the context of the ageing and weathering of stone surfaces are corrosion and soiling. Corrosion refers to damage to surfaces as a result of chemical reactions, while soiling is exclusively the consequence of the deposition of airborne particulate matter (PM) on the light-coloured façades of buildings and stone monuments. Previous published studies in the literature suggest that current atmospheric conditions are tolerable for cultural heritage in Slovenia, which, however, does not mean that there is no room for improvement.

On the basis of a risk assessment for stone heritage in Slovenia, with specific reference to limestone cultural heritage, we propose, in the first place, a limitation of HNO_3 and PM_{10} concentrations in the atmosphere. The most sensible measures in this context include reducing traffic in cities, tightening standards for wood-fired combustion devices and raising public awareness of the harmfulness of uncontrolled burning of biological and other waste.

Katharina Zanier

Simonov zaliv (Izola): poskusna digitalna 3D-rekonstrukcija rimske obmorske vile

Izvirni znanstveni članek
COBISS 1.01

UDK
728.84:902.2(497.4Izola)
7.021.23:728.84(497.4Izola)

Ključne besede: rimska obmorska vila, rimska arhitektura, rimsko pristanišče, rimska kulturna krajina, digitalna 3D-rekonstrukcija, virtualna arheologija, Izola, Simonov zaliv

Izvleček

Po naročilu Turističnega združenja Izola je bila leta 2021 izdelana poskusna digitalna 3D-rekonstrukcija rimske obmorske vile v Simonovem zalivu (Izola). V prispevku je najprej na kratko predstavljena rimska vila – njen tloris, arhitekturni okras, kronologija in pristanišče, kakor tudi turistični pomen. Nato se osredotočamo na parametre, ki smo jih določili za samo rekonstrukcijo stavbnega kompleksa, pristanišča in okolice. Sledi obrazložitev metodologije izdelave 3D-rekonstrukcije vile. Zatem obravnavamo namembnosti 3D-rekonstrukcij in načela, ki so se na mednarodni ravni uveljavila za 3D-rekonstrukcije, to so t. i. *Seville Principles*. V sklepu ocenjujemo uporabnost omenjenih načel glede na primer naše 3D-rekonstrukcije.

Povzetek

V prispevku predstavljamo poskusno digitalno 3D-rekonstrukcijo rimske obmorske vile v Simonovem zalivu (Izola), ki je kulturni spomenik državnega pomena. Gre za najbolje ohranjene in raziskane ostanke rimske obmorske vile s pristaniščem v Sloveniji. Arheološki arhitekturni kompleks leži na prostoru, ki obsega pet hektarjev in ga sestavljajo delno raziskani rezidencialni predel vile na rtiču Korbat, vodovod ter pristanišče z bankino, pomolom in valobranom ter velik predel skladiščnih ali podobnih funkcionalnih površin.

Jedro vile je bilo zgrajeno okoli leta 30 pr. n. št. Kmalu zatem, leta 15 pr. n. št., ta stavba ni več zadoščala bivalnim in gospodarskim potrebam stanovalcev cvetočega kompleksa. Stanovanjski del vile so zato med letoma 15 pr. n. št. in 15. n. št. povečali in luksuzno opremili s stebrišči, mozaiki in stenskimi poslikavami. Obseg vile je ostal nespremenjen do leta 70 n. št., ko je bil severni del stavbe opuščen, južni del pa je živel naprej v spremenjeni, osiromašeni obliki do 4. ali 5. stoletja n. št., pristanišče pa še dlje.

Najdišče Simonov zaliv ima velik turistični potencial. Na pobudo Turističnega združenja Izola je leta 2021 v okviru projekta *Izola – digitalni otok* nastala digitalna 3D-rekonstrukcija vile, ki jo tukaj predstavljamo. Rekonstrukcija je bila pripravljena za fazo, datirano med letoma 15 pr. n. št. in 70 n. št. (ko je bila vila v največjem razcvetu), in temelji deloma na izkopanih ostalinah vile, deloma pa na rezultatih geofizikalnih raziskav. V prispevku so predstavljeni parametri, ki smo jih določili za rekonstrukcijo. Sledi obrazložitev metodologije izdelave 3D-rekonstrukcije vile.

Nato na kratko orišemo zgodovino razvoja in namembnosti 3D-rekonstrukcij na področju kulturne dediščine in obravnavamo načela, ki so se na mednarodni ravni uveljavila za virtualne arheološke rekonstrukcije, to so

Docentka dr. Katharina Zanier, Univerza v Ljubljani, Filozofska fakulteta, Oddelek za arheologijo in Zavod za varstvo kulturne dediščine Slovenije, Katharina.Zanier@ff.uni-lj.si

International Principles of Virtual Archaeology oziroma t. i. *Seville Principles*. V sklepu preverjamo uporabnost omenjenih načel glede na izkušnjo s poskusno digitalno rekonstrukcijo vile.

Uvod

V okviru projekta *Izola – digitalni otok*, ki je sofinanciran s strani Ministrstva za gospodarski razvoj in tehnologijo ter Evropskega sklada za regionalni razvoj, je bila leta 2021 izdelana poskusna digitalna 3D-rekonstrukcija rimske obmorske vile v Simonovem zalivu (Izola). Naročnik je bilo Turistično združenje Izola, nosilec projekta je bilo podjetje Arctur, d. o. o., rekonstrukcijo pa je izdelalo podjetje Avgusta, d. o. o., ob strokovni podpori predstavnice Oddelka za arheologijo Filozofske fakultete Univerze v Ljubljani in avtorice tega članka. Namen poskusne digitalne rekonstrukcije je bil skratka turističen. To je pomembno omeniti, saj je bil celoten projekt naravnan na turiste kot ciljno publiko.

V prispevku najprej na kratko predstavimo rimsko vilo, njen tloris, arhitekturni okras, kronologijo in pristanišče. Orišemo tudi sosledje projektov, ki so vodili do izrazito turistično usmerjene vizije razvoja najdišča ter v končni fazi tudi do izvedbe 3D-rekonstrukcije, ki jo tukaj predstavljamo. Nato se osredotočamo na parametre, ki smo jih določili za samo rekonstrukcijo stavbnega kompleksa, pristanišča in okolice. Sledi obrazložitev metodologije izdelave 3D-rekonstrukcije vile. Nato na kratko orišemo zgodovino razvoja in namembnosti 3D-rekonstrukcij na področju kulturne dediščine in obravnavamo načela, ki so se na mednarodni ravni uveljavila za virtualne arheološke rekonstrukcije, to so *International Principles of Virtual Archaeology* oziroma t. i. *Seville Principles*. V sklepu preverjamo uporabnost omenjenih načel glede na izkušnjo s poskusno digitalno rekonstrukcijo vile in pojasnimo nekatere alternativne rešitve, ki smo jih izbrali.

Kratka predstavitev rimske obmorske vile

Poskus 3D-rekonstrukcije smo pripravili za arheološko najdišče Simonov zaliv, ki je kulturni spomenik državnega pomena (EŠD 195). Gre za najbolje ohranjene in raziskane ostanke rimske obmorske vile s pristaniščem v Sloveniji. Arheološki arhitekturni kompleks v Simonovem zalivu leži na prostoru, ki obsega pet hektarjev in ga sestavljajo delno raziskani rezidencialni predel vile na rtiču Korbat, vodovod, pristanišče z bankino, pomolom in valobranom ter velik predel skladiščnih ali podobnih funkcionalnih prostorov neposredno pod hribom Kane, kjer je v morju ob pristanišču še vedno vidna grajena kamnita ploščad (slika 1) (Stokin, Zanier, 2011).

Na rtiču Korbat, kjer je tudi z zaščitno ograjo omejena površina arheološkega parka, sta bila do sedaj raziskana in odkrita le dva predela večje rezidencialne stavbe oziroma območji 1 in 2. Kompleks je na vzhodu verjetno mejil na potok Rikorvo (Stokin, Zanier, 2011: 47).

Na območju 1, osrednjem delu vile, so se v preteklosti vrstila številna sondiranja in izkopavanja. Območje 2, južni predel vile ob portiku, je bilo izkopano večinoma med letoma 1986 in 1991, v letih 2009 in 2010 ter nato v letih 2015 in 2016, v sklopu projekta AS (Stokin, Zanier, 2011; Lazar, 2016a, 2016b; Groh, Sedlmayer, 2017).

Informacije o drugih površinah stavbnega kompleksa imamo večinoma le na podlagi geofizikalnih raziskav. Simonov zaliv je najdišče, v katerem je prišlo do številnih poskusov izvedbe tovrstnih preiskav. Že leta 1970 je Geološki zavod opravil prve geofizikalne raziskave na rtu Korbat, a so bile žal neuspešne (Lapajne, Kelhar, 1970). Leta 1994 je podjetje Tecno Futur Service iz Bomporta (Modena) opravilo nove geofizikalne meritve. Po meritvah, opravljenih z georadarjem, je bilo izvedenih 10 zelo omejenih testnih sond, vendar tudi v tem primeru raziskave niso dale jasnih rezultatov (TecnoFuturService, 1994; Kajfež, 1995). Leta 2006 je ekipa pod vodstvom Branka Mušiča z Univerze v Ljubljani opravila geofizikalne raziskave, ki so končno razkrile razsežnost arhitekturnih ostankov vile na rtu Korbat (Mušič, 2006). Zadnje geofizikalne raziskave na širšem območju Simonovega zaliva je med letoma 2008 in 2010 vodil Stefan Groh z Avstrijskega arheološkega inštituta z Dunaja, opravil pa je tudi revizijska sondiranja (Groh, Sedlmayer, 2008; Groh et al., 2009; Groh, Sedlmayer, 2009; Groh, Sedlmayer, 2017). Na podlagi teh raziskav, torej tudi upoštevajoč rezultate geofizikalnih raziskav, je Stefan Groh v letu 2010 tudi izdelal prvi shematični poskus 3D-rekonstrukcije vile, v letu 2012 pa je nastal drugi poskus po zasnovi Marka Stokina in Vide Bitenc.

Na podlagi rezultatov novejših raziskav Stefana Groha lahko orišemo osnovno kronološko zaporedje gradbenih faz vile. Prostori, združeni v območje 1, so najstarejše jedro vile, zgrajeno v zadnjih desetletjih pr. n. št., prostori območja 2 pa so del nekaj desetletij mlajše razširitve vile, ki se je zaključila najkasneje v času cesarja Tiberija (Groh, Sedlmayer, 2008; Groh et al., 2009; Groh, Sedlmayer, 2009; Stokin, Zanier, 2011; Groh, Sedlmayer, 2017). Območji se nekoliko razlikujeta tudi v usmerjenosti zidov, precejšnje razlike pa so v absolutni višini hodnih površin oziroma mozaikov, ki je na območju 2 v povprečju za 0,56 m nižja kot na območju 1. Zamik mlajšega dela vile območja 2, v primerjavi s severnim, starejšim delom vile območja 1, znaša 6 stopinj proti zahodu.

Na osnovi omenjenih raziskav lahko torej zaključimo, da je jedro vile s pristanom v Simonovem zalivu bilo zgrajeno okoli leta 30 pr. n. št. Kmalu zatem, leta 15 pr. n. št., ta stavba ni več zadoščala bivalnim in gospodarskim potrebam stanovalcev cvetočega kompleksa. Stanovanjski del vile so zato med letoma 15 pr. n. št. in 15. n. št. povečali in luksuzno opremili s stebrišči, mozaiki in stenskimi poslikavami. Obseg vile je ostal nespremenjen do leta 70 n. št., ko je bil severni del stavbe opuščen (Groh, Sedlmayer, 2017: 94–97, 221), južni del pa je živel naprej v spremenjeni, osiromašeni obliki do 4. ali 5. stoletja n. št., pristanišče pa še dlje.[1]

Raziskani ostanki stavbe kažejo, da so v tem predelu vile ohranjeni izrazito bogati elementi arhitekture bivalne narave z mozaiki, stenskimi poslikavami, portiki in različnimi stebrnimi kapiteli. Južni portik je bil dolg več kot 66 metrov in je povezoval pristaniški predel kompleksa z južnimi deli vile. Ob portiku so veliki bivalni prostori z bogatim mozaičnim okrasjem, med katerimi je postavljen hodnik (*fauces*) za dostop do notranjega dela vile. Omenjeni prostori so bili s portikom povezani prek širokih odprtin s pragovi iz velikih kamnitih blokov, v katerih so vdolbine za tečaje (Stokin, Zanier, 2011: 49).

Mozaiki vile so vsi črno-beli: najpogostejši so beli mozaiki, obrobljeni s črnimi pasovi, zlasti v južnem delu vile se pojavljajo tudi modularni geometrični motivi. Pragovi so še posebej skrbno okrašeni, tako tudi v severnem delu vile najdemo mozaični prag, ki upodablja portik z arkadami z visečimi reliefi (*oscilla*) (Stokin, Zanier, 2011: 51–74). Na fragmentih poslikanega stenskega ometa so motivi, ki jih večinoma lahko umeščamo v tretji pompejski slog (miniaturne edikule, krilata rastlinska bitja, girlande; amorčki, upodobljeni pri uporabi ritualnih predmetov itd.) (Stokin, Zanier, 2011: 85–86). Podobne primerke najdemo namreč v bogatem repertoarju tretjega sloga z območja Vezuva (Bastet, de Vos, 1979) in v severni Italiji; slogovno gledano so jim še najbližje poslikave v zgodnjem tretjem slogu v avgustejskem *domusu* v samostanu San Domenico v Imoli (Maioli, 1997; Zanier, 2012: 318).

Pristanišče je sestavljeno iz treh delov, ki so zgrajeni iz velikih blokov peščenjaka: obalnega zidu ali bankine, ki ščiti prst pred erozijo, pomola in dolgega valobrana, ki pristanišče varuje pred vetrom. Pomol (dolžina: 55 m) in bankina (dolžina: 120 m) sta ohranjena pod modernimi strukturami. V kotu med pomolom in bankino je bil zgrajen pravokoten objekt, ki je verjetno nastal pozneje (Stokin et al., 2008). Valobran (zunanja dolžina: 110 m, notranja dolžina: 84,2 m), ki je dobro viden med oseko, ni bil koncipiran kot skalomet, vendar je zgrajen zelo pravilno iz velikih pravokotnih blokov, zato lahko sklepamo, da je bil v uporabi tudi kot dodaten pomol (Stokin et al., 2008; Stokin, Zanier, 2011: 75–78). Ravno višina struktur pristanišča v Simonovem zalivu dobro dokazuje proces postopnega zviševanja morske gladine v zadnjih 2000 letih za 1,60 m (Antonioli et al., 2007; Antonioli et al., 2008). Zaradi ugodne lege in dolgega valobrana so ladje v pristanišču lahko pristajale tudi v močnem vetru (Degrassi, 1955); to so bile ladje *myriophorus*, *corbita* in *corbita vinaria* dolžine do 25 m in z ugrezom do 3 m, ki so lahko natovorile tudi do 1000 amfor vina (Viereck, 1975: 148–149). Vendar pa je malo verjetno, da bi domnevna lokalna pridelava vina, oljčnega olja in drugih dobrin sezonske narave zadoščala za ekonomsko upravičenost graditve tako velikega pristanišča (Stokin, 2001: 407). Zato lahko sklepamo, da obsežno pristanišče (8000 m^2), ki je tedaj bilo med največjimi na zahodni obali Istre, ni služilo le potrebam vile, ampak je bilo distribucijski center za širši prostor in je zato najbrž imelo velika skladišča; ta s precejšnjo verjetnostjo lahko prepoznamo v jugozahodnem delu zaliva, kjer je v morju vidna kamnita ploščad s stojkami, podobne ostaline pa so bile odkrite tudi v sondiranju leta 2001 na sosednjem območju (Novšak, 2006: 182; Stokin, Zanier, 2011: 78). Vila je bila opremljena tudi s podzemnim vodovodom, sestavljenim iz keramičnih cevi (Stokin, Zanier, 2011: 79–80).

Izolska obala je na splošno bogata z rimskodobnimi arheološkimi najdbami. V Izoli so rimske najdbe[2] znane na območju nekdanjega izolskega otoka[3] (ANSl, 1975: 144; Frelih, 1994; Karinja, 2006; Rondič, 2017), predvsem na območju palače Manzioli (Frelih, 1994; Rondič, 2017), kjer je mogoče stala druga obmorska vila. Strukture pristanišča so še vedno vidne ob obali v Viližanu, nasproti njih na kopnem pa so bili raziskani prostori rimske zgradbe (Degrassi, 1955; Boltin-Tome, 1991; Stokin et al., 2008: 67). Številne druge rimskodobne najdbe poznamo tudi v izolskem zaledju.

Najdišče Simonov zaliv ima velik turistični potencial, ki je bil tudi že zgodaj prepoznan. Ostaline vile so bile prvič prezentirane javnosti po osamosvojitvi Slovenije, ko so potekali konservatorsko-restavratorski posegi na mozaikih (Bogovčič, 1994) in nekatere pedagoško-interpretacijske dejavnosti, kot so poletne arhitekturno-arheološke delavnice in latinsko-arheološki tabori. Takratni Medobčinski zavod za varstvo kulturne dediščine Piran je do leta 1999 s pomočjo Ministrstva za kulturo Republike Slovenije redno vzdrževal mozaike (Vrzelj, 1993), nato je sledilo kratko obdobje zatišja.

Zametki prve namenske turistične valorizacije najdišča segajo v projekt Interreg Slovenija-Hrvaška *HEART of Istria – Heritage and Art. Development of cross-border tourist itineraries in urban and rural areas*, izveden med letoma 2005 in 2007 (Darovec et al., 2007; Zanier, 2008). Kot partner v omenjenem projektu je od leta 2005 za najdišče (in arheološki park v nastajanju) skrbel takratni Inštitut za dediščino Sredozemlja Znanstveno-raziskovalnega središča Univerze na Primorskem. Kot formalna podlaga za upravljanje je bil nato sklenjen tripartitni sporazum

1 Pristanišče, z dodanimi lesenimi strukturami, je bilo verjetno v uporabi vsaj še v 9. stoletju (Karinja, Čerče, 2008).

2 V Izoli je bilo odkritih tudi več rimskih napisov, na primer *CIL* V, 482 = *InscrIt* X.3, 36; *CIL* V, 497 = *InscrIt* X.3, 37; *CIL* V, 483 = *InscrIt* X.3, 38; Pokrajinski muzej Koper, inv. št. 4116.

3 Izola je bila do 19. stoletja otok; ozki morski preliv, ki je ločeval otok od kopnega in čez katerega je bil postavljen most, je bil takrat zasut zaradi prekomernega nabiranja smeti (Bernik, 1968: 104).

(2010) med Univerzo na Primorskem, Zavodom za varstvo kulturne dediščine in Občino Izola, ki je lastnica območja najdišča. Od takrat je območje arheološkega parka v poletnih sezonah dostopno javnosti (Lazar, 2011), kar je bilo omogočeno tudi s finančno podporo Občine Izola. Naslednji korak v razvoju parka je bil strateški projekt *PArSJAd – Arheološki parki severnega Jadrana*, ki je potekal med letoma 2010 in 2014 v okviru Programa čezmejnega sodelovanja Slovenija–Italija. Med drugim je bil takrat tudi pripravljen prvi načrt upravljanja parka, ki je bil kasneje še posodobljen (Lazar, Zanier, 2012, 2014).

Vendar so bili že odkriti, izrazito bogati mozaiki vile do nedavnega pokriti z zaščitnimi zasutji, zaradi česar sta bili pričevalnost in tudi privlačnost arheološkega parka bistveno okrnjeni. Univerza na Primorskem je kot upravljavec arheološkega parka in vodilni partner pridobila nepovratna sredstva iz Programa finančnega mehanizma EGP 2009–2014 za sofinanciranje projekta *AS – Arheologija za vse. Oživljanje arheološkega parka Simonov zaliv* (Lazar, 2016a, 2016b). V sklopu projekta so bili konservirani in prezentirani zidovi in mozaiki vile; v tem kontekstu je v letu 2015 hrvaško podjetje Vektra, d. o. o., tudi opravilo terestrično lasersko skeniranje in fotogrametrijo začetnega in končnega stanja mozaikov (Lesar Kikelj et al., 2018). Za zaščito prezentiranih ostalin so bila postavljena jadrna nadkritja, urejen je bil sistem drenaže. Na najdišču je bil vzpostavljen tudi manjši interpretacijski center. Prav tako je bil na območju pristanišča vile zasnovan prvi podvodni arheološki park v Sloveniji (Lazar, 2016a, 2016b). Prizadevanja za konservacijo mozaikov se sicer še danes nadaljujejo.

V okviru projekta *Izola – digitalni otok*, ki sta ga v okviru Javnega razpisa za dvig kompetenc vodilnih turističnih destinacij in razvoj turistične ponudbe vodilnih turističnih destinacij v letih 2020 in 2021 sofinancirala Ministrstvo za gospodarski razvoj in tehnologijo in Evropski sklad za regionalni razvoj, je novo pobudo prevzelo Turistično združenje Izola (internet 1). Med drugim sta ravno v tem projektu nastali nova fotogrametrija in 3D-rekonstrukcija, ki jo tukaj predstavljamo in ki je bila tudi vključena v širšo iniciativo *Tourism 4.0 Heritage+* (internet 2).

Elementi in parametri 3D-rekonstrukcije

Območje kompleksa obmorske vile v Simonovem zalivu smo za potrebe rekonstrukcije najprej razdelili po osnovni prostorski namembnosti. Stavba vile je bila glede na rezultate invazivnih in neinvazivnih raziskav zamejena na področje rtiča Korbat. Vzhodno od vile je še danes prisoten vodnjak. Čeprav v raziskavah niso bili odkriti elementi za njegovo datacijo v rimski čas (Kajfež, 1995), smo ga v rekonstrukcijo vključili, saj so vodnjaki v rimskodobnih najdiščih ne glede na hkratno prisotnost vodovoda zelo pogosti (Šavel, Kerman, 2008; Vitasović, 2008; Gaspari, 2010; Cipriano, Pettenò, 2011: *passim*; Jelinčić Vučković, 2015). Na tem območju, do potoka Rikorvo, smo v rekonstrukciji predvideli oljčnik, četudi ni arheoloških ostankov, ki bi ga potrjevali prav na tej lokaciji; oljkarstvo je klasična poljedelska dejavnost, ki je na prostoru Istre v rimskem obdobju na splošno dobro dokumentirana (Labud, 1996: 137; Matijašić, 1998; Cipriano, 2009: 176–177; Tassaux, 2009; Zaccaria, 2012; Zanier, 2015: 40).[4] Zahodno od stavbe vile leži pristanišče, ob katerem so v jugozahodnem delu zaliva velika skladišča.

Za območje velikega pristanišča je bilo določeno tlakovanje iz peščenjaka, medtem ko so bile za skladišča, zaradi arheološko dokazane prisotnosti stojk, predlagane enostavne lesene strukture.[5] Na podlagi položaja omenjenih predelov kompleksa obmorske vile in drugih dejavnikov je bil določen domnevni potek lokalnih poti.

Hipotetična digitalna rekonstrukcija stavbe vile je bila pripravljena za fazo, datirano med letoma 15 pr. n. št. in 70 n. št. V tem obdobju je bila vila v največjem razcvetu. Kot je bilo že prej omenjeno, je bila vila le deloma izkopana, deloma pa lahko rekonstruiramo njen tloris na podlagi rezultatov geofizikalnih raziskav Stefana Groha (Groh, Sedlmayer, 2017: 59, slika 69).

Izkopani zidovi vile so bili večinoma ohranjeni samo na nivoju temeljev, kar pomeni, da velikokrat nimamo informacij o točni lokaciji vrat, oken, dekorativnih motivov stenskih poslikav itd. Zaradi tega so številni elementi digitalne rekonstrukcije le domnevni in temeljijo na primerjavah s podobnimi kompleksi. To velja zlasti za stenske poslikave, za katere smo uporabili posnetke dobro ohranjenih sočasnih primerov fresk.

Na tlorisu, ki združuje izkopane strukture in tiste, prepoznane z geofizikalnimi raziskavami (slika 2), so bili naprej določeni nepokriti prostori oziroma notranja dvorišča. Pri tem smo upoštevali obliko prostora, položaj in primerjave. Manjše pravokotne strukture, ki so zaznamovale te prostore, smo interpretirali kot bazenčke oziroma nimfeje. Vegetacija znotraj notranjih dvorišč je bila oblikovana po vzoru rimskih vrtov, zlasti tistih s pompejskega območja, za katere obstajajo temeljite študije, tudi na osnovi odlitkov korenin, ki so pustile praznine v nasutjih vezuvskega pepela (Gleason, Jashemski, 2018).

4 Tako kot so na področju Istre seveda tudi dobro dokumentirani vinarstvo (Labud, 1995; Matijašić, 1998) in ovčereja (Giovannini, 1993; D'Incà, 1994; Ventura et al., 2012) ter ribištvo in marikultura (Stokin et al., 2008; Pesavento Mattioli, Carre, 2009: *passim*).

5 Podobno enostaven nadstrešek na lesenih nosilcih je bil rekonstruiran za vinsko skladišče 1. stoletja pr. n. št. keltske naselbine z močnimi rimskimi vplivi *oppidum* Bratislava, sicer seveda z drugačnim naklonom strehe, primernim tudi za snežne razmere in močne padavine (Musilová, Minaroviech, 2015: 5, 13, slika 14).

Nato je bila določena lokacija stebrov, tako kot izhaja iz rezultatov izkopavanj ali pa na podlagi oblike prostorov in primerjav.

Sledila je določitev višine streh in njihovega naklona, kar je najbolj domnevni del rekonstrukcije, saj za strešne strukture na splošno ni veliko primerjalnih podatkov iz drugih najdišč, razen seveda v nekaj izjemnih primerih z območja Vezuva. Iz teh primerov izhaja, da so bile rimske strešne konstrukcije zelo razgibane, da so se prilagajale posameznim skupinam prostorov in da so bile oblikovane na način, da so omogočale ne samo odtekanje vode, ampak tudi njeno zbiranje (Centola, 2018). Tako smo v našem primeru predvideli tri razrede višine strehe, naklon posameznih delov strehe pa je bil določen na način, da bi zagotovili ustrezno odtekanje in zbiranje vode. Streho nad stebriščnimi hodniki smo oblikovali kot najnižjo, z višino od 3 m spredaj do 3,5 m na vrhu, saj je bila na podlagi primera ohranjenih elementov stebrov njena višina izračunana na približno 3 m (Stokin, Zanier, 2011: 53), in sicer v skladu z razmerjem med višino in premerom stebra (ki v našem primeru znaša okoli 35 cm), kot nam ga podajajo Vitruvij (in sicer v III. in IV. knjigi njegovega dela *De architectura*) in številni ohranjeni primeri rimskih stebrov (Wilson Jones, 1989). Drugi odseki strehe so bili postavljeni višje (med 4 in 5 m ter med 5,5 in 6 m).

Vrata smo postavili tja, kjer so bili najdeni pragovi, dodatno pa tudi na druge lokacije, zlasti v povezavi s strukturami, identificiranimi z geofizikalnimi raziskavami. Vratna krila so bila oblikovana v skladu s posameznimi ohranjenimi primeri vrat iz Herkulaneja ter podobami s stenskih poslikav (Demetrescu et al., 2016: 57, slika 6; internet 9). Okna so bila postavljena na način, da bi zagotovili zadostno razsvetljavo posameznih prostorov, in sicer precej visoko, kakor prav tako izhaja iz primerov bivalne arhitekture s področja Vezuva. Za zunanjost vile in stebre smo določili osnovne stenske poslikave z rdečim podzidkom in belo osnovo, kar je pogosta rešitev za zunanjščino in stebre (internet 7 in 8; podobno v Demetrescu et al., 2016: sliki 8 in 14).

Za notranjost stavbe vile smo imeli na voljo fotogrametrične modele mozaikov, ki so bili načeloma dobro ohranjeni, medtem ko so bili fragmenti stenskih poslikav zelo skopi in poleg tega tudi najdeni večinoma v sekundarni legi v recentnih nasutjih. Okrasja torej ni bilo mogoče pripisati posameznim prostorom, niti ni bila možna rekonstrukcija poslikav celotnih sten. Ker bi shematični, nevtralni prikaz poslikav ustvaril prevelik kontrast z realističnim fotogrametričnim modelom mozaikov, smo se odločili za vključitev fotografij dobro ohranjenih stenskih poslikav sočasnih objektov z vezuvskega območja, kot je vila Agripe Postuma v Boscotrecasu iz zadnjega desetletja 1. stoletja pr. n. št. (internet 10).

Izdelava 3D-rekonstrukcije

Poskus digitalne rekonstrukcije obmorske vile je zajemal delo na terenu in računalniško obdelavo z nadgradnjo zajetih in na podlagi predhodnih raziskav pridobljenih podatkov. Na lokaciji vile smo z brezpilotnim letalnikom zajeli 360-stopinjski pogled oziroma panoramo bližnje okolice in horizonta. S pomočjo lidarskega posnetka (© ARSO) smo dobili 3D-model okolice, ki smo ji dodali zajeto panoramo s horizontom. Zaradi delno preoblikovanega reliefa (Izola ni več otok) in sodobnih posegov, kmetijskih in infrastrukturnih, je bilo treba okolico prilagoditi in odstraniti elemente, ki ne spadajo v rimsko dobo.

Na podlagi geofizikalnih in drugih že opravljenih raziskav smo delno znani tloris objektov in pristanišča digitalno rekonstruirali glede na zgoraj omenjene parametre. Fotogrametrični modeli mozaikov podjetja Arctur, d. o. o., so bili podlaga za obdelavo in digitalno dograditev poškodovanih delov mozaikov. Kot je bilo že omenjeno, smo za prikaz fresk v notranjosti vile uporabili fotografije stenskih poslikav sočasnih objektov. Pristanišče smo opremili s prikazom plovil, pomol z osnovnim naborom naprav in zabojev blaga, ozadje vile pa z vozom, da bi rekonstrukcijo nekoliko poživili.[6] Plovila so prikazana tudi na strani valobrana, saj zaradi njegove pravilne gradnje lahko sklepamo, da je bil ta, kot že prej omenjeno, v uporabi tudi kot pomol oziroma za privez ladij.

Sledila je video obdelava oziroma animacija modela, kjer so se določili pogledi in pot kamere ter montaža samega videa, ki traja 2,09 minute. Dodani so bili še podnapisi in ostali podatki ter logotipi. Še posebej pomembni so v našem primeru podnapisi (v slovenščini, italijanščini, angleščini in nemščini), saj smo vanje vključili pomembna spremna pojasnila. Poleg samih informacij o vili smo namreč navedli specifike in domnevne aspekte rekonstrukcije, torej to, da je bila vila deloma izkopana in da poznamo del zidov le na podlagi interpretacije rezultatov geofizikalnih raziskav. Prav tako opozarjamo na večinoma domnevno lokacijo vrat in seveda oken. Izrecno je tudi omenjeno, da smo uporabili posnetke dobro ohranjenih sočasnih primerov fresk, saj rekonstrukcija stenskih poslikav na podlagi posameznih najdenih fragmentov s samega najdišča ni bila mogoča. V podnapise smo skratka vključili pomembno sporočilo o domnevnosti številnih aspektov same rekonstrukcije.

Pri delu smo uporabili naslednjo programsko opremo: Blender, Nuke, Houdini in Adobe Creative Suite.

Distribucija posnetka 3D-rekonstrukcije vile v različnih jezikih je potekala po kanalih in za namene Turističnega združenja Izola (internet 5). Nekaj pogledov rekonstrukcije je prikazanih v slikah 3–11.

6 Za podobne podobe gl. rekonstrukcijo rečnega pristanišča v Akvileji (internet 6).

Namembnosti 3D-rekonstrukcij na področju kulturne dediščine

Za potrebe izdelave digitalne 3D-rekonstrukcije obmorske vile v Simonovem zalivu smo se tudi širše ozirali na različne možnosti, ki nam jih tovrstne rekonstrukcije ponujajo, a tudi na načela, ki jih je treba pri njihovi izdelavi upoštevati.

Virtualne rekonstrukcije v 3D-okolju omogočajo prikaz predmetov, arhitekturnih kompleksov in celo kontekstov preteklosti, ki so danes ohranjeni v slabem ali spremenjenem stanju. Prav iz tega razloga je uporaba virtualnih rekonstrukcij posebno razširjena na področju arheologije, čeprav je koristna tudi za druge discipline kulturne dediščine, in sicer za raziskovalne in konservatorske oziroma restavratorske namene, pa tudi in predvsem v sklopu popularizacije dediščine (Stančić, Zanier 2012: 63).

Tridimenzionalni računalniški grafični pristopi so se razcveteli v televizijski in filmski industriji s prvim komercialnim paketom programske opreme Wavefront Technologies, izdanim leta 1984 (Schreibman, Papadopoulos, 2019: 224). Približno istočasno so nastali prvi poskusi digitalnega modeliranja arheoloških in historičnih arhitekturnih objektov, ki so bili takrat izjemen pojav (Reilly, 1992, 93–97), kot v primeru verjetno prvih tovrstnih rekonstrukcij galo-rimskega templja boginje *Sulis Minerva* v Bathu (Blagg, 1982; Smith, 1985; Lavender et al., 1990; Woodwark, 1991) in stavbe kopališča v rimski trdnjavi Caerleon v Južnem Walesu (Smith, 1985; Woodwark, 1991), kot tudi animiranega modela Old Minsterja v Winchestru (Burridge idr., 1989; Reilly, Todd, Walter, 2016) ali računalniške rekonstrukcije deloma uničene katedrale Cluny III (Cramer, Koob, 1993: 58–103; Messemer 2019: 251). Po prvih omenjenih projektih so se virtualne rekonstrukcije razširile na različna področja in imajo lahko zelo različne namembnosti.

Na področju raziskovanja virtualne rekonstrukcije omogočajo vizualizacijo in testno evalvacijo različnih hipotez. Koristne so torej predvsem za kompleksne kontekste dediščine, kjer bi bila sama (tradicionalna) grafična rekonstrukcija preobremenjena ter manj fleksibilna za progresivno posodobitev modela med obnavljanjem raziskovalnih podatkov in hipotez (gl. o tem že Sims, 1997).

Posebno področje virtualne resničnosti predstavljajo na primer tridimenzionalne obrazne rekonstrukcije skeletov in mumij. Razvoj moderne discipline obrazne rekonstrukcije (angl. *facial reconstruction*), ki je seveda dosegla posebno pomembnost v sklopu forenzične medicine, izhaja prav iz konteksta arheoloških problemov identifikacije slavnih zgodovinskih oseb, za katere se je poskusilo ugotoviti istovetnost s pomočjo primerjave plastično modelirane fiziognomije, realizirane na podlagi konformacije lobanje s portreti (Prag, Neave, 1995). Sodobni postopki predvidevajo uporabo medicinskih tehnologij, kot je CT, za podrobno rekognosciranje osteoloških ali na primeru mumij tudi fizioloških ostankov, tudi brez odstranjevanja zunanjih oblog (na primer povojev ali celo sarkofagov); iz tridimenzionalnega modela lobanje tehnike virtualnega modeliranja omogočajo rekonstrukcijo volumna (angl. *warping*) ter morebitni videz (angl. *texture*) obraza (Betrò idr., 2007).

Virtualne rekonstrukcije se lahko tudi aplicirajo na svitke iz papirusa, arhivske vire in druge dokumente, še posebej izpostavljene deterioraciji. Nove tehnologije omogočajo namreč ne samo digitalizacijo in fleksibilno arhiviranje dokumentov, temveč tudi virtualni poseg restavriranja, ki omogoča izboljšanje berljivosti vsebine. Za te namene je bil na primer pred leti izpostavljen mednarodni konzorcij za projekt *Isyreadet* oziroma *Integrated System for Recovery and Archiving Degraded Texts* (Console *et al.*, 2006): v sklopu projekta so bili z multispektralno kamero digitalizirani testni, posebno slabo ohranjeni pisni dokumenti, ki so bili obdelani z različnimi algoritmi za izboljšanje slik (analiza neodvisnih komponent, metode dekorelacije, anizotropični filtri, matematična morfologija). Projekt je prikazal prednosti metodologije, četudi je uporaba podobnih postopkov še vedno precej omejena. Verjetno najbolj odmevni projekti na tem področju so bili namenjeni virtualnemu odvijanju in restavriranju zvitkov iz Herkulaneja, da bi omogočili branje njihovih besedil, ne da bi jih fizično odvili, kar se je v preteklosti izkazalo kot neuspešen, škodljiv pristop. Po preizkusu različnih tehnik skeniranja (mikro-CT, XPCT), obdelave in modeliranja so virtualni pristopi dali zelo dobre rezultate (Bukreeva idr., 2016; Stabile idr., 2021).

Virtualnemu restavriranju včasih sledi fizična restavracija, za katero lahko virtualni model tvori tudi operativno aplikacijo, ki vodi strojno restavratorsko opremo. Informacijski sistemi pa lahko predvsem olajšajo delo restavratorja, tako da omogočajo avtomatizirano združevanje fragmentov za potencialno ponovno sestavo predmeta ali na primer poslikanih ometov s pomočjo matematičnih algoritmov, ki vrednotijo predvsem homogenost fragmentov ter oblike lomov. Posebno slavo je dosegel projekt za restavriranje poslikav bazilike sv. Frančiška v Assisiju, porušenih v potresu v letu 1997; kmalu zatem je bil prvič vzpostavljen informacijski sistem, ki je omogočal digitalno manipulacijo in združevanje okvirno 120.000 fragmentov ometa, ki so bili nato v skladu z digitalnim modelom dejansko restavrirani (Basile, 1998; 2009; Limoncelli, 2012: 95). Podobni sistemi so bili izdelani tudi za bronastodobne poslikave Akrotirija (Brown idr., 2008) in Tirinta (Papaodysseus idr., 2012) ter za rimske stenske poslikave iz Celja (Filipič idr., 2011; Gutman idr., 2015: 786). Institut »Jožef Stefan« in Zavod za varstvo kulturne dediščine Slovenije sta razvila strokovno računalniško aplikacijo Pedius, ki omogoča digitalizacijo fragmentov in njihovo sestavljanje, ter nato še spletno in mobilno aplikacijo e-Pedius (internet 4), ki je dostopna vsem zainteresiranim uporabnikom.

Verjetno najbolj razširjena je uporaba virtualne resničnosti za popularizacijo dediščine. Za boljše razumevanje posameznega dediščinskega konteksta je namreč predvsem za širšo javnost pomembno povezati sliko današnjega stanja spomenika z rekonstrukcijo originalnih oblik in različnih razvojnih faz. Za te namene so sicer tudi »tradicionalne«, grafične risbe večkrat dovolj jasne, vendar je zagotovo dostopnost digitalnih rekonstrukcij preko spleta in geolokacijskih sistemov ter mobilnih aplikacij neprimerljivo večja, digitalni prikazi so popolnoma prilagodljivi ter omogočajo različne poglede in nivoje informacij, posodobitve in nadgradnje, možnosti interakcije gledalcev in kombinacije različnih stimulov. Hkrati so tovrstni prikazi primerni za različne medije ter pripomočke prezentacije in interpretacije. Prikaze, ustvarjene v digitalnem okolju, seveda lahko, tako kot tradicionalne risarske, uporabljamo na tiskanih izdelkih (brošure, table itd.) in raznih statičnih gledalnikih, kot so stereoskopi in pleksiplošče (sliki 12 in 13). Poleg računalnikov, samostoječih zaslonov (totemov), pametnih telefonov in tablic ter 3D-projekcijskih dvoran poznamo že vrsto let VR-očala z vgrajeno vizualizacijsko napravo, ki omogoča sprehod po virtualno rekonstruiranem najdišču,[7] podobno tudi enostavnejše naglavne sete, v katere lahko vstavimo lastni pametni telefon (gl. na primer Ray Bibek, Deb, 2016). Opozarjamo tudi na morebitne dodatne možnosti in koristi, ki jih lahko nudijo tovrstne digitalne rekonstrukcije, kot so svetlobne projekcije in hologrami, ki počasi, vendar neustavljivo prodirajo na področje prezentacije ne samo premične, ampak tudi nepremične dediščine (slika 14) (Marazuela Kim, 2015). Ne nazadnje lahko 3D-rekonstrukcije povezujemo tudi s področjem 3D-tiskanja maket in miniaturnih modelov, ki je lahko prav tako pomembno področje, predvsem z vidika vključevanja oseb s posebnimi potrebami oziroma zlasti slepih in mogoče tudi v perspektivi proizvajanja spominkov. Panoga virtualne arheologije za rekreativne namene in kulturni turizem pa je tudi izpostavljena številnim pastem, ki so povezane zlasti z vsebinskimi nedoslednostmi in s konceptom relativne avtentičnosti (Melotti, 2011, 8–17). Zato je tudi pri izdelavi 3D-rekonstrukcij treba upoštevati določena načela[8].

7 Tehnologija se je, ne glede na dolgo uporabo, samo zmerno razširila, verjetno predvsem iz higienskih razlogov in ker so tovrstna očala slabo prilagodljiva za osebe z napakami vida, ki nosijo korekcijska očala.

8 Potreba po oblikovanju načel za vsa področja ohranjanja in upravljanja kulturne dediščine (vključno z interpretacijo, adaptacijo in drugimi posegi ter vzdrževanjem) je še posebej izpostavljena v ICOMOS-ovi deklaraciji o dediščini in demokraciji iz New Delhi-ja (ICOMOS 2017).

Načela izdelave 3D-rekonstrukcij na arheološkem področju

Prva načela na tem področju so bila formulirana v Londonski listini za računalniške prikaze kulturne dediščine (*The London Charter for the computer-based visualisation of cultural heritage*: Beacham, Niccolucci, Denard, 2009), pripravljeni med letoma 2006 in 2009 na osnovi pobude, ki je nastala na konferenci v Londonu z naslovom *Making 3D Visual Research Outcomes Transparent* (internet 3). V Londonski listini je bilo predvideno, da bi se na posameznih področjih oblikovale posebne izvedbene smernice (člen 1.1); to se je za arheološko področje že v letu 2010 tudi udejanjilo s pripravo t. i. *Seville Principles* oziroma *International Principles of Virtual Archaeology*, ki jih je na generalni skupščini v letu 2017 tudi sprejel ICOMOS (*Seville Principles*, 2017).

Virtualne rekonstrukcije so v arheologiji, kot je bilo že omenjeno, prisotne že nekaj desetletij in se lahko uporabljajo kot ustrezna alternativa fizičnim. Zaradi fragmentarne narave arheoloških ostalin in pretežno skopih informacij o prvotnem izgledu stavb ali drugih kontekstov na podlagi primerjav in drugih virov so digitalne rekonstrukcije na arheološkem področju zelo zahtevne, rešitve pa lahko raznolike, sploh če upoštevamo vse možne ciljne skupine tovrstnih rekonstrukcij. Seviljska načela so bila oblikovana, da bi to pomembno področje uredili, vendar so ga, zahvaljujoč prispevku Španskega združenja za virtualno arheologijo (*Sociedad Española de Arqueología Virtual*), razširili na bolj celovit koncept virtualne arheologije, to je »znanstvene discipline, ki si prizadeva raziskovati in razvijati načine uporabe računalniških prikazov na področju celovitega upravljanja arheološke dediščine«. Slednje, po definiciji v samih Seviljskih načelih, »vključuje inventarje, preglede, izkopavanja, dokumentiranje, raziskovanje, vzdrževanje, varstvo, konserviranje, restavriranje, interpretacijo, prezentacijo, dostop in javno uporabo materialnih ostalin preteklosti«. Seviljska načela predvidevajo različne vrste virtualnih prikazov, to so virtualno restavriranje (angl. *virtual restoration*), virtualna anastiloza (angl. *virtual anastylosis*), virtualna rekonstrukcija (angl. *virtual reconstruction*) in virtualno poustvarjanje (angl. *virtual recreation*), ter jih definirajo, kot sledi:

»– Virtualno restavriranje: vključuje uporabo virtualnega modela za razvrščanje razpoložljivih materialnih ostankov, da bi vizualno poustvarili nekaj, kar je obstajalo v preteklosti. Virtualna restavracija tako tudi vključuje virtualno anastilozo.
– Virtualna anastiloza: vključuje ponovno sestavljanje obstoječih, vendar razčlenjenih delov v virtualnem modelu.
– Virtualna rekonstrukcija: vključuje uporabo virtualnega modela za prikaz prvotnega stanja zgradbe ali predmeta, ki so ga ustvarili ljudje v danem trenutku v preteklosti, na podlagi razpoložljivih fizičnih dokazov teh zgradb ali

predmetov, znanstveno podprtih primerjalnih domnev in na splošno vseh študij, ki so jih izvedli arheologi in drugi strokovnjaki na področju arheologije in zgodovine.
- Virtualno poustvarjanje: vključuje uporabo virtualnega modela za prikaz arheološkega najdišča v danem trenutku v preteklosti, vključno z materialno kulturo (premično in nepremično dediščino), okoljem, krajino, običaji in splošnim kulturnim pomenom.« (*Seville Principles*, 2017, 3)

Seviljskih načel je osem (*Seville Principles*, 2017, 5–9):
- Načelo 1 – interdisciplinarnost: virtualno arheologijo morajo podpirati strokovnjaki iz različnih strok.
- Načelo 2 – namen: namen ali cilj virtualnega arheološkega dela mora biti jasno opredeljen in implicira različne ravni podrobnosti, ločljivosti in natančnosti; razlikujemo lahko tri glavne smeri delovanja virtualne arheologije, to so raziskave, konservatorsko-restavratorska dejavnost ter interpretacija; slednja se dalje deli na izobraževalno (formalno in neformalno) in rekreativno področje (kulturni turizem).
- Načelo 3 – komplementarnost: »računalniške prikaze za celovito upravljanje arheološke dediščine je treba obravnavati kot dopolnilno in ne alternativno orodje bolj tradicionalnim, a enako učinkovitim načinom upravljanja« (»npr. virtualno restavriranje ne bi smelo nadomestiti dejanskih restavratorskih postopkov, tako kot virtualni obiski ne bi smeli nadomestiti resničnih obiskov«, razen seveda v primerih, kadar so arheološke ostaline uničene ali nedostopne).
- Načelo 4 – avtentičnost: »računalniški prikazi običajno rekonstruirajo ali poustvarijo zgodovinske zgradbe, artefakte in okolja, kakršni verjamemo, da so bili v preteklosti. Zaradi tega bi moralo biti vedno mogoče razlikovati to, kar je resnično, pristno ali avtentično, od tega, kar ni«; zagotoviti je treba alternativne virtualne interpretacije, »če imajo enako znanstveno veljavnost; če enakosti ni, se privilegira sama glavna hipoteza«.
- Načelo 5 – zgodovinska doslednost: virtualna arheologija »mora biti podprta s trdnimi raziskavami ter zgodovinsko in arheološko dokumentacijo«.
- Načelo 6 – učinkovitost: »manjša uporaba virov za doseganje vedno večjih in boljših rezultatov je ključ do učinkovitosti«.
- Načelo 7 – znanstvena transparentnost: »vsi računalniški prikazi morajo biti v njihovem bistvu preverljivi«.
- Načelo 8 – usposabljanje in evalvacija: virtualna arheologija kot posebna znanstvena disciplina nujno »zahteva posebne programe usposabljanja in vrednotenja«.

Čeprav se omenjena načela ne zdijo prezahtevna niti preobsežna, vidimo, da se kot celota v praksi redko upoštevajo v arheoloških 3D-rekonstrukcijah, ki so pogosto izdelane brez ustreznih spremnih pojasnil. Sami smo načela poskusili čim dosledneje upoštevati, sicer z manjšimi odstopanji, kar bomo v sklepu tudi pojasnili.

Sklep

Glede na zgornje definicije virtualnih prikazov bi naš primer uvrstili med virtualno rekonstrukcijo in virtualno poustvarjanje, saj so bili vključeni tudi elementi okolja in krajine, medtem ko je bila namembnost prostorov le točkovno nakazana s posameznimi dodatki (naprava in tovor na pomolu, ladja v pristanišču, voz na potki in material v skladišču). Na tem področju bi imeli na razpolago veliko več možnosti s prikazom dodatnih elementov v krajini (oljčniki, trte, črede ovac itd.) ter na posestvu in v stavbnem kompleksu vile (oprema in pohištvo), tudi s človeškimi figurami, ki bi modelu seveda vdahnile življenje, a nam to ni bilo dosegljivo zaradi omejenih sredstev. Na splošno lahko ugotovimo, da so tovrstni nekoliko bolj kreativni prikazi še posebej ustrezni na področju arheoloških najdišč, saj velikokrat za širšo publiko ni toliko pomembno dojemanje samih arhitekturnih oblik, ampak razumevanje namembnosti posameznih prostorov, kar se najlažje doseže z dodatkom artefaktov, kulturnih rastlin, živali in osebkov, ki izvajajo specifične dejavnosti. Tovrstni dodatki zagotavljajo večjo atraktivnost virtualnih 3D-modelov in motivirajo gledalce k natančnejšemu opazovanju, razmišljanju in torej interakciji, kar bistveno poveča učinke teh pripomočkov.

Kar se tiče samih Seviljskih načel, smo skladno z razpoložljivimi sredstvi in možnostmi upoštevali načelo interdisciplinarnosti (načelo 1). Prav tako je bil namen naše rekonstrukcije jasno definiran (načelo 2) v skladu z željami naročnika, to je Turističnega združenja Izola: rekonstrukcija je bila namenjena boljši interpretaciji najdišča, in sicer zlasti za rekreativne namene kulturnega turizma. V skladu s tem je bil oblikovan celoten projekt. Gre za »komplementarni« pripomoček, ki je na voljo dejanskim in potencialnim obiskovalcem najdišča (načelo 3).

Priznati moramo, da naša rekonstrukcija nekoliko odstopa pri načelu 4, to je pri avtentičnosti. Vizualno v našem modelu namreč ni možno razlikovati, kaj je bilo od same vile dejansko ohranjeno in kaj je bilo domnevno rekonstruirano ali pa samo nakazano na podlagi primerjav. To predvsem zato, ker je večji del rekonstrukcije pravzaprav rezultat interpretativne hipoteze, saj je bil izkopan samo del tlorisa vile, drugi del je bil rekonstruiran na podlagi interpretacije izsledkov geofizikalnih raziskav, izkopani zidovi so bili ohranjeni le na nivoju temeljev, ostanki arhitekturnega okrasja so bili prav tako zelo skopi, od poslikanih ometov pa so bili ohranjeni samo posamezni fragmenti, najdeni v sekundarnem položaju. Zdelo se nam je, da bi bilo vizualno nemogoče jasno izraziti vse omenjene odtenke problematike in omejitve, zato smo se odločili za spremno besedilo, v katerem smo pojasnili posebno situacijo in naše ravnanje. Zato lahko rečemo, da smo načelo avtentičnosti uresničili s pomočjo razlage v podnapisih. Taka odločitev je bila povezana tudi s samim namenom rekonstrukcije, ki smo ga že določili v zvezi z načelom 2, torej rekreativni namen v sklopu kulturnega turizma.

Zgodovinsko doslednost iz načela 6 smo upoštevali in ustvarili enoten prikaz faze največjega razcveta obmorske vile v Simonovem zalivu. Sama rekonstrukcija je glede na prej predstavljene parametre preverljiva in ponovljiva (načelo 7).

V povezavi z načelom 8, usposabljanje in evalvacija na področju virtualne arheologije, ugotavljamo, da se to kot specifično področje izobraževanja v Sloveniji komaj vzpostavlja. Diplomske, magistrske in doktorske naloge s področja arheologije, informatike in arhitekture so sicer obravnavale tovrstne teme,[9] prav tako so potekale nekatere delavnice[10] in bili izvedeni številni projekti,[11] vendar ponudba formalnega usposabljanja na tem interdisciplinarnem področju ni zelo razvita. Prostor za izboljšave vidimo tudi pri evalvaciji izdelkov virtualne arheologije, ki bi prav tako potrebovala vzpostavitev točne metodologije in kriterijev glede na različne namene samih izdelkov ter v projektih namensko predvideno stroškovno postavko.

Na splošno sta vedno večja pocenitev opreme za zajem in obdelavo podatkov ter večja dostopnost tudi brezplačnih programov (Stopinšek et al., 2013, 95–96) omogočili širjenje zmožnosti virtualne arheologije. Glede na veliko priljubljenost in nedvomno korist virtualne arheologije ter vedno večjo dostopnost opreme in programov bi bilo torej dobrodošlo, da bi tudi pri nas uvedli celovito in formalno izobraževanje ter usposabljanje na tem področju, saj je virtualna arheologija že zdavnaj prerasla samo področje interpretacije dediščine za rekreativne namene in ima lahko pomembno funkcijo tudi na področju raziskovanja (zlasti preverjanja hipotez) in konservatorsko-restavratorske stroke.

9 Omenjamo samo nekatere primere: Lužnik, 2009; Djokić, 2012; Štuhec, 2012; Zajec, 2013; Jerala, 2017; Mavrič, 2017; Guček Puhar, 2018; Štuhec, 2019; Tomiek, 2020; Filipović, 2022.

10 Npr. delavnica *Zajem in obdelava 3D podatkov v podvodni arheologiji*, ki je potekala v Portorožu od 1. do 5. 7. 2013 (Erič et al., 2013).

11 Med projekti izpostavimo Heritage+, v katerem je partnerstvo za Turizem 4.0 v pomoč turističnim destinacijam po Sloveniji razvilo komplet orodij za digitalno inoviranje kulturne dediščine. Pripravljeni so bili Priročnik za digitalno inoviranje kulturne dediščine (Straus, Starc Peceny, Ilijaš, 2019) in smernice digitalizacije kulturne dediščine; v letih 2020 in 2021 so bile prvič izvedene Heritage+ delavnice v sodelovanju z Ministrstvom za gospodarski razvoj in tehnologijo (internet 2). Gl. tudi projekt CONPRA: Zachar et al., 2017; Tasić et al., 2017.

Viri in literatura

ANSI (1975): *Arheološka najdišča Slovenije*. Ljubljana, Slovenska akademija znanosti in umetnosti.

Antonioli, F., Anzidei, M., Lambeck, K., Auriemma, R., Gaddi, D., Furlani, S., idr. (2007): Sea-level change during the Holocene in Sardinia and in northeastern Adriatic (central Mediterranean Sea) from archaeological and geomorphological data. *Quaternary Science Review*, 26, str. 2463–2486.

Antonioli, F., Furlani, S., Lambeck, K., in Stravisi, F. (2008): Archaeological and geomorphological data to deduce sea level changes during the late Holocene in the North-Eastern Adriatic. V: Auriemma, R., in Karinja, S. (ur.): *Terre di mare. L'archeologia dei paesaggi costieri e le variazioni climatiche*, str. 221–234. Trieste, Piran, Università degli studi di Trieste, Pomorski muzej - Museo del mare "Sergej Mašera" Piran.

Basile, G. (2009): Il digitale nel restauro: un esempio di ricomposizione virtuale assistita nei frammenti del San Matteo di Cimabue dalla volta della Basilica Superiore di San Francesco in Assisi. *DigItalia*, 4(1), str. 24–43.

Basile, G., in Giandomenico, N. (ur.) (1998): *Il cantiere dell'Utopia: notizie dal cantiere dei dipinti in frammenti della Basilica Superiore di San Francesco in Assisi.* Assisi, Sacro convento di San Francesco in Assisi.

Bastet, F. L., in De Vos, M. (1979): *Proposta per una classificazione del terzo stile pompeiano*. Roma, Nederlands Institut de Rome.

Beacham, R., Niccolucci, F., in Denard, H. (2009): *The London Charter for the computer-based visualisation of cultural heritage.* https://www.londoncharter.org (Version 2.1) (dostop 1. 9. 2022).

Bernik, J. (1968): *Organizem slovenskih obmorskih mest: Koper, Izola, Piran.* Ljubljana, Mladinska knjiga.

Betrò, M., Imboden, S., in Gori, R. (2007): Volti per le mummie. La ricostruzione facciale tridimensionale assistita dal calcolatore applicata alle mummie dell'antico Egitto. V: Coralini, A., in Scagliarini Corlaita, D. (ur.): *Ut natura ars: Virtual Reality e archeologia*, str. 91–96. Imola, University Press Bologna.

Blagg, T. F. C. (1982): Reconstructions of Roman decorated architecture: proportions, prescriptions and practices. V: Drury, P. J. (ur.): *Structural reconstruction: approaches to the interpretation of the excavated remains of buildings*, British Archaeological Reports International Series 110, str. 131–151. Oxford, British Archaeological Reports.

Bogovčič, I. (1994): Ostanki antičnih mozaikov in fresk v Simonovem zalivu. *Varstvo spomenikov*, 35, str. 7–17.

Boltin-Tome, E. (1989): Arheološke najdbe na morskem dnu slovenske Obale. *Kronika: časopis za slovensko krajevno zgodovino*, 37, str. 6–16.

Brown, B., Toler-Franklin, C., Nehab, D., Burns, M., Dobkin, D., Vlachopoulos, A., idr. (2008): A system for high-volume acquisition and matching of fresco fragments: Reassembling theran wall paintings. *ACM Transactions on Graphics*, 27(3), št. 84.

Bukreeva, I., Mittone, A., Bravin, A., Festa, G., Alessandrelli, M., Coan, P., idr. (2016): Virtual unrolling and deciphering of Herculaneum papyri by X-ray phase-contrast tomography. *Scientific reports*, 6, št. 27227.

Burridge, J. M., Collins, B. N., Gaton, B. N., in Halbert, A. R. (1989): The WINSOM solid modeller and its application to data visualization. *IBM Systems Journal*, 28(4), str. 548–568.

Centola, V. (2018): *I sistemi di copertura nelle domus di età romana.* Doktorska disertacija, Università degli Studi di Padova.

CIL (1863–): *Corpus Inscriptionum Latinarum: consilio et auctoritate Academiae litterarum Borussicae editum*. Berlin, Apud G. Reimerum.

Cipriano, S. (2009): Le anfore olearie Dressel 6B. V: Pesavento Mattioli, S., in Carre, M. B. (ur.): *Olio e pesce in epoca romana: produzione e commercio nelle regioni dell'Alto Adriatico.* Antenor – Quaderni, 15, str. 173–189. Roma, Edizioni Quasar.

Cipriano, S., in Pettenò, E. (2011): *Archeologia e tecnica dei pozzi per acqua dalla pre-protostoria all'età moderna.* Antichità altoadriatiche, 70. Trieste, Editreg.

Console, E., Burdin, V., Cazuguel, G., Legnaioli, S., Palleschi, V., Tassone, R., idr. (2006): Isyreadet: un sistema integrato per il restauro virtuale di documenti antichi. *Annali della facoltà di Benevento*, 12, str. 195–206.

Darovec, D., Panjek, A., Kavrečič, P. (ur.) (2007): *Srce Istre. Poti kulturne dediščine/Heart of Istria. Heritage and art: cultural itineraries.* Koper, Univerza na Primorskem, Znanstveno-raziskovalno središče, Založba Annales.

Degrassi, A. (1955): I porti romani dell'Istria. V: *Anthemon. Studi di Archeologia e di Antichità Classiche in onore di Carlo Anti*, str. 119–169. Firenze, G. C. Sansoni = Degrassi, A. (1957): I porti romani dell'Istria. *Atti e Memorie della Società Istriana di Archeologia e Storia Patria (N. S.)*, 5, str. 24–82 = Degrassi, A. (1962): I porti romani dell'Istria. V: *Scritti Vari di Antichità II*, str. 821–870. Roma, Comitato d'onore.

Demetrescu, E., Ferdani, F., Dell'Unto, N., Leander Touati, A., Lindgren, St. (2016): Reconstructing the original splendour of the House of Caecilius Iucundus. A complete methodology for virtual archaeology aimed at digital exhibition. *SCIentific RESearch and Information Technology*, 6(1), str. 51–66.

D'Incà, C. 2004: Pecore e lana nella decima regio orientale. *Histria Antiqua*, 12, str. 205–216.

Djokić, S. (2012): *Uporaba informacijsko komunikacijskih tehnologij v muzejski komunikaciji.* Diplomsko delo. Univerza v Ljubljani, Filozofska fakulteta.

Erič, M., Solina, F., Perkovič, M., Grosman, D., in Stopinšek, Ž. (2013): *Zajem in obdelava 3D podatkov v podvodni arheologiji.* Portorož, Ljubljana, Zavod za varstvo kulturne dediščine Slovenije. http://eprints.fri.uni-lj.si/2920/ (dostop 1. 9. 2022).

Filipic, B., Mlakar, M., Dovgan, E., in Tušar, T. (2011): Razvoj sistema za računalniško podprto evidentiranje in sestavljanje fragmentov stenskih poslikav. *Zbornik 14. mednarodne multikonference Informacijska družba*, str. 45–48. Ljubljana, Institut Jožef Stefan.

Filipović, D. (2022): *Interaktivna vizualizacija arheološkega najdišča v navidezni resničnosti.* Diplomsko delo. Univerza v Ljubljani, Fakulteta za računalništvo in informatiko.

Frelih, M. (1994): *Poročilo o izkopavanjih v hiši Manzioli, Izola.* Neobjavljeno poročilo. Piran, Zavod za varstvo kulturne dediščine Slovenije, Območna enota Piran.

Gaspari, A. 2010, *"Apud horridas gentis ---". Začetki rimskega mesta Colonia Iulia Emona/Beginnings of the Roman town of Colonia Iulia Emona.* Ljubljana, Muzej in galerije mesta Ljubljana.
Giovannini, A. (1993): L'allevamento ovino e l'industria tessile in Istria. *Atti e Memorie della Società Istriana di Storia Patria*, n.s. 41, str. 7–34.

Gleason, K. L., in Jashemski, W. F. (ur.) (2018): *Gardens of the Roman Empire.* Cambridge, Cambridge University Press.

Groh S., in Sedlmayer, H. (2017): *Otium cum dignitate et negotium trans mare : la villa marittima di San Simone (Simonov zaliv) in Istria (Slovenia).* Bologna, Ante Quem.

Groh, S., Guštin, M., Lazar, I., in Sedlmayer, H. (2009): Neue Forschungen in der römischen Villa Marittima von San Simone/Simonov zaliv bei Izola, Slowenien. *Archäologie Österreichs*, 20(1), str. 53–57.

Groh, S., in Sedlmayer, H. (2008): Die Grabungen in der Römischen Villa Maritima von San Simone/Simonov zaliv bei Isola/Izola, Slowenien. *Annales, Series Historia et Sociologia*, 18, str. 385–396.

Groh, S., in Sedlmayer, H. (2009): Nuove ricerche nella villa maritima romana di San Simone/Simonov zaliv presso Isola/Izola (Slovenia). *Aquileia Nostra*, 80, str. 233–258.

Guček Puhar, E. (2018): *Primerjava 3D modelov paleolitske lesene konice.* Diplomsko delo. Univerza v Ljubljani, Fakulteta za računalništvo in informatiko.

Gutman, M., Kikelj Lesar, M., Kuret, J., in Kramar, S. (2015): Mortar - type identification for the purpose of reconstructing fragmented Roman wall paintings (Celje, Slovenia). *Materiali in tehnologije*, 49(5), 785–790.

ICOMOS 2017: *Delhi Declaration on Heritage and Democracy*. https://www.icomos.org/images/DOCUMENTS/Charters/GA2017_Delhi-Declaration_20180117_EN.pdf (dostop 1. 12. 2022).

InscrIt (1931–): *Inscriptiones Italiae.* Roma, La Libreria dello Stato.

Internet 1: https://www.visitizola.com/info/izola-digitalni-otok (dostop 1. 9. 2022).

Internet 2: https://tourism4-0.org/heritage/toolkit/ (dostop 1. 9. 2022).

Internet 3: https://www.londoncharter.org/history.html (dostop 1. 9. 2022).

Internet 4: http://e-pedius.si/ (dostop 1. 9. 2022).

Internet 5: https://www.youtube.com/watch?v=84Sj7EPYVPg (dostop 1. 9. 2022).

Internet 6: https://www.archeomedia.net/udine-lantica-aquileia-rinasce-in-3d/ (dostop 1. 9. 2022).

Internet 7: https://www.pesaromusei.it/area-archeologica-via-dellabbondanza/ (dostop 1. 10. 2022).

Internet 8: http://kosmostudio.altervista.org/domus-romana.html (dostop 1. 10. 2022).

Internet 9: https://www.romanoimpero.com/2019/06/le-porte-degli-edifici-romani.html (dostop 1. 10. 2022).

Internet 10: https://www.metmuseum.org/art/collection/search/250930 (dostop 1. 10. 2022).

Internet 11: https://twitter.com/Ajn1Stajn/status/1470854602669142027/photo/1 (dostop 1. 10. 2022).

Jelinčić Vučković, K. (2015): *Rimsko selo u provinciji Gornjoj Panoniji: Virovitica Kiškorija Jug/Roman village in the Province of Upper Pannonia: Virovitica Kiškorija South.* Monografije Instituta za arheologiju, 7. Zagreb, Institut za arheologiju.

Jerala, M. (2017): *Herkulov tempelj in svetišče v Celju: peripterni in psevdoperipterni templji v Sloveniji.* Doktorska disertacija. Univerza v Ljubljani, Filozofska fakulteta.

Kajfež, T. (1995): *Terenski dnevnik SS1/95.* Neobjavljeno poročilo. Piran, Zavod za varstvo kulturne dediščine Slovenije, Območna enota Piran.

Karinja, S. (2006): Nota preliminare sulle ricerche archeologice nella chiesa s. Maria D'Alieto di Isola/Izola. V: Guštin, M., Gelichi, S., in Spindler, K. (ur.): *The heritage of the Serenissima: the presentation of the architectural and archaeological remains of the Venetian Republic.* Annales Mediterranea, str. 19–22. Piran, Znanstveno-raziskovalno središče Koper, Inštitut za dediščino Sredozemlja, Založba Annales.

Karinja, S., in Čerče, P. (2008): The Roman Port at the St. Simon's Bay, Izola. The 1994 rescue excavations. V: Radić Rossi, I., Gaspari, A., in Pydyn, A. (ur.): *Proceedings of the 13th Annual Meeting of the European Association of Archaeologists. Session: Underwater Archaeology*, str. 196–206. Zagreb, Hrvatsko arheološko društvo.

Kikelj Lesar, M., Dolenec, S., Ravnik, M., Škrjanec, N., in Zanier, K. (2018): Rimska obmorska vila v Simonovem zalivu v Izoli (Slovenija): konservatorsko-restavratorski posegi na mozaikih in preliminarni rezultati arheoloških raziskav v sklopu projekta AS (2015–2017)/Roman villa maritima in Simonov Zaliv, Izola (Slovenia): conservation-restoration interventions on mosaics and preliminary results of archaeological investigations in the context of the AS project (2015–2017). *Varstvo spomenikov*, 50, str. 11–50.

Labud, G. (1995): *Ricerche archeologico-ambientali dell'Istria settentrionale: la valle del fiume Risano.* Jonsered, P. Åströms förlag.

Labud, G. (1996): Studio tipologico di reperti anforici rinvenuti nel sito archeologico romano di San Simone (Simonov zaliv), nell'Istria settentrionale. *Opuscula romana*, 20, str. 254–260.

Lapajne, J., in Kelhar, T. (1970): *Geofizikalne raziskave: Simonov zaliv-Izola.* Neobjavljeno poročilo. Ljubljana, Piran, Geološki zavod, Pomorski muzej Sergej Mašera.

Lavender, D., Wallis, A., Bowyer, A., in Davenport, P. (1990): Solid Modelling of Roman Bath. *Science and Archaeology*, 32, str. 20–27.

Lazar, I. (2011): Rimska vila Simonov zaliv: možnosti predstavitve mozaikov = La villa romana nella baia di San Simone. V: Stokin, M., in Dolenec, S. (ur.): *Mozaiki severnega Jadrana*, str. 161–174. Ljubljana, Zavod za varstvo kulturne dediščine Slovenije.

Lazar, I. (ur.) (2016a): *AS – Arheologija za vse: Oživljanje arheološkega parka Simonov zaliv. Priročnik projekta.* Koper, Univerza na Primorskem.

Lazar, I. (2016b): Kratka predstavitev projekta in projektnih sodelavcev. V: Lazar, I. (ur.): *AS – Arheologija za vse. Oživljanje arheološkega parka Simonov zaliv*. Priročnik projekta, str. 8–16. Koper, Univerza na Primorskem.

Lazar, I., in Zanier, K. (2012): *Načrt upravljanja za arheološki park Simonov zaliv (2012–2016) EŠD 195. 1.* Elaborat. Piran, Univerza na Primorskem, Znanstveno-raziskovalno središče, Inštitut za dediščino Sredozemlja.

Lazar, I., in Zanier, K. (2014): *Načrt upravljanja za arheološki park Simonov zaliv (2012–2016 ter usmeritve 2016–2021) EŠD 195. 1/2.* Elaborat. Piran, Univerza na Primorskem, Znanstveno-raziskovalno središče, Inštitut za dediščino Sredozemlja.

Limoncelli, M. (2012): *Il restauro virtuale in archeologia.* Roma, Carocci.

Lužnik, N. (2011): *Računalniška vizualizacija rimske vile Stari Trogir.* Diplomska naloga. Univerza v Ljubljani, Filozofska fakulteta.

Maioli, M. G. (1997): Intaci dipinti della domus dell'ex convento di S. Domenico ad Imola. V: Scagliarini Corlaita, D. (ur.): *I temi figurativi nella pittura parietale antica (IV sec. a.C. – IV sec. d.C.)*. Atti del Convegno Internazionale sulla pittura parietale antica, str. 233–391. Bologna, University Press Bologna.

Matijašić, R. (1998): *Gospodarstvo antičke Istre, arheološki ostaci kao izvori za prepoznavanje društveno-gospodarskih odnosa u Istri u antici.* Povijest Istre, 4. Pula, Zavičajna naklada ˝Žakan Juri˝.

Marazuela Kim, A. (2015): Re-enchantment and Iconoclasm in an Age of Images. *The Hedgehog Review*, 17(3), str. 48–54.

Mavrič, K. (2017): *Vizualizacija cerkve sv. Vida, Ajba.* Diplomsko delo. Univerza v Ljubljani, Filozofska fakulteta.

Melotti, M. (2011): *The Plastic Venuses: Archaeological Tourism in Post-Modern Society*. Newcastle upon Tyne, Cambridge Scholars Publishing.

Messemer, H. (2019): WissenschaftlicheRezeption digitaler 3D-Rekonstruktionen vonhistorischer Architektur. V: Sahle, P. H. (ur.): *Digital Humanities: multimedial & multimodal*, str. 250–253. Mainz, Frankfurt, Universitäten zu Mainz und Frankfurt.

Münster, S., Friedrichs, K., in Hegel, W. (2018): 3D Reconstruction Techniques as a Cultural Shift in Art History?. *International Journal for Digital Art History*, 3, str. 39–59.

Musilová, M., in Minaroviech, J. (2015): 3D Reconstructions of Roman Buildings from the 1st century BC on the Celtic Hillfort in Bratislava. *International Conference on Cultural Heritage and New Technologies Proceedings*, str. 1–15. Wien, Stadt Archäologie Wien.

Mušič, B. (2006): *Poročilo o geofizikalnih raziskavah v Simonovem zalivu.* Neobjavljeno poročilo. Zavod za varstvo kulturne dediščine Slovenije, Območna enota Piran, Univerza na Primorskem, Znanstveno-raziskovalno središče, Inštitut za dediščino Sredozemlja.

Novšak, M. (2006): Simonov zaliv. *Varstvo spomenikov*, 39–41, str. 181–183.

Papaodysseus, C., Arabadjis, D., Exarhos, M., Rousopoulos, P., Zannos, S., Panagopoulos, M., idr. (2012): Efficient solution to the 3D problem of automatic wall paintings reassembly. *Computers & Mathematics with Applications*, 64(8), str. 2712–2734.

Pesavento Mattioli, S., in Carre, M. B. (ur.) (2009): *Olio e pesce in epoca romana: produzione e commercio nelle regioni dell'Alto Adriatico.* Antenor – Quaderni, 15. Roma, Edizioni Quasar.
Prag, J., in Neave, R. (1995): *Making faces.* London, British Museum Press.

Ray Bibek, A., in Deb, S. (2016): Smartphone Based Virtual Reality Systems in Classroom Teaching –a study on the effects of learning outcome. V: Kumar, V., in Murthy Kinshuk, S. (ur.): *2016 IEEE Eighth International Conference on Technology for Education (T4E)*, str. 68–71. Los Alamitos, Washington, Tokyo, The Institute of Electrical and Electronics Engineers
.
Reilly, P. (1992): Three-dimensional modelling and primary archaeological data. V: Rahtz, S., in Reilly, P. (ur.): *Archaeology and the Information Age: A Global Perspective*, str. 92–106. London, New York, Routledge.

Reilly, P., Todd, S., in Walter, A. (2016): Rediscovering and modernising the digital Old Minster of Winchester. *Digital Applications in Archaeology and Cultural Heritage*, 3(2), str. 33–41.

Rondič, D. (2017): *Izolski otok z okolico v antiki: arheološka izkopavanja na območju Manziolijeve palače.* Diplomska naloga. Univerza v Ljubljani, Filozofska fakulteta.

Šavel, I., in Kerman, B. (2008): *Gornje njive pri Dolgi vasi.* Ljubljana, Zavod za varstvo kulturne dediščine Slovenije.
Schreibman, S., in Papadopoulos, C. (2019): Textuality in 3D: three-dimensional (re)constructions as digital scholarly editions. *International Journal of Digital Humanities*, 1, str. 221–233.

Seville Principles (2017): *International Principles of Virtual Archaeology*. http://sevilleprinciples.com/ (dostop 1. 9. 2022).

Sims, D. (1997): Archaeological models: pretty pictures or research tools?. *IEEE Computer Graphics and Applications*, 17(1), str. 13–15.

Smith, I. (1985): Romans make a high-tech comeback: Sid and Dora's Bath Show Pulls the Crowd. *Computing*, 27. 6. 1985, str. 7–8.

Stabile, S., Palermo, F., Bukreeva, I., Mele, D., Formoso, V., Bartolino, R., idr. (2021): A computational platform for the virtual unfolding of Herculaneum Papyri. *Scientific reports*, 11(1), št. 1695.

Stančić, H., in Zanier, K. (ur.) (2012): *Heritage Live. Upravljanje dediščine z informacijskimi orodji.* Koper, Univerzitetna založba Annales.

Stokin, M. (2001): Simonov zaliv: antična vila. *Annales, Series Historia et Sociologia*, 11(2), str. 405–412.

Stokin, M., Gaspari, A., Karinja, S., in Erič, M. (2008): Archaeological research of maritime infrastructure of Roman settlements on the Slovenian coast of Istria (1993–2007). V: Auriemma, R., in Karinja, S. (ur.): *Terre di mare. L'archeologia dei paesaggi costieri e le variazioni climatiche*, str. 56–74. Trieste, Piran, Università degli studi di Trieste, Pomorski muzej – Museo del mare "Sergej Mašera" Piran.

Stokin, M., in Zanier, K. (2011): *Simonov zaliv/San Simone.* Vestnik, 23. Ljubljana, Zavod za varstvo kulturne dediščine Slovenije.

Stopinšek, Ž., Berginc, B., Erič, M., in Solina, F. (2013): Uvajanje 3D tehnologij pri varstvu kulturne dediščine. V: Potočnik, B. (ur.): *ROSUS 2013: računalniška obdelava slik in njena uporaba v Sloveniji 2013.* Zbornik 8. strokovne konference, str. 89–97. Maribor, Fakulteta za elektrotehniko, računalništvo in informatiko, Inštitut za računalništvo.

Straus, M., Starc Peceny, U., in Ilijaš, T. (2019): *Digitalno inoviranje kulturne dediščine: priročnik za turistične destinacije.* Nova Gorica, Arctur.

Štuhec, S. (2012): *Dvoinpolrazsežnostna (2,5D) in trirazsežnostna (3D) vizualizacija artefaktov*. Diplomsko delo. Univerza v Ljubljani, Filozofska fakulteta.

Štuhec, S. (2019): *Uporaba trirazsežnostnega dokumentiranja za arheološko analizo stoječe vernakularne arhitekture.* Doktorska disertacija. Univerza v Ljubljani, Filozofska fakulteta.

Tasić, N., Novaković, P. in M. Horňák (2017): *Virtual reconstructions and computer visualisations in archaeological practice.* Ljubljana, Znanstvena založba Filozofske fakultete.

Tassaux, F. (2009): Fullonicae, huileries ou ateliers de salaisons? Interrogations sur quelques sites istrien. V: Pesavento Mattioli, S., in Carre, M. B. (ur.): *Olio e pesce in epoca romana: produzione e commercio nelle regioni dell'Alto Adriatico.* Antenor – Quaderni, 15, str. 101–111. Roma, Edizioni Quasar.

TecnoFuturService (1994): *Indagini G.P.R. per la definizione di strutture sepolte nell'area archeologica di San Simone – Isola (Slovenia).* Neobjavljeno poročilo. Piran, Zavod za varstvo kulturne dediščine Slovenije, Območna enota Piran.

Tomiek, K. (2020): *Uporaba sodobnih metod zajema in obdelave podatkov za umeščanje virtualnih objektov v prostor.* Magistrsko delo. Univerza v Mariboru, Fakulteta za gradbeništvo, prometno inženirstvo in arhitekturo.

Ventura, P., Giovannini, A., in Petrucci, G. (2012): L'allevamento ovino e la lavorazione della lana nella parte orientale della X Regio: resti architettonici, testimonianze materiali, archeozoologia. V: Busana, St., in Basso, P. (ur.), *La lana nella Cisalpina romana. Economia e società*, str. 171–194. Padova, Padova University Press.

Verzel, D. (1993): *Terenski dnevnik konservatorskih del.* Neobjavljeno poročilo. Piran, Zavod za varstvo kulturne dediščine Slovenije, Območna enota Piran.
Viereck, H. D. L. (1975): *Die Römische Flotte: Classis Romana.* Herford, Koelhlers Verlagsgesellschaft.

Vitasović, A. (2008): Opskrba vodom i rimski vodovod na brdu Gradina na otoku Veliki Brijun. *Histria Archaeologica*, 37, str. 47–82.

Wilson Jones, M. (1989): Designing the Roman Corinthian Order. *Journal of Roman Archaeology*, 2, 1989, str. 35–69.

Woodwark, J. R. (1991): Reconstructing history with computer graphics. *IEEE Computer Graphics and Applications*, 11(1), str. 18–20.

Zaccaria, C. (2012): Un nuovo duoviro della colonia romana di Tergeste e la produzione di olio nell'Istria settentrionale. V: Demougin, S., in Scheid, J. (ur.): *Colons et colonies dans le monde romain.* Collection de l'École française de Rome, 456,

str. 107–121. Roma, École française de Rome.

Zachar, J., Novaković, P. in M. Horňák (2017): *3d Digital Recording of Archaeological, Architectural and Artistic Heritage*. Ljubljana, Znanstvena založba Filozofske fakultete.

Zajec, L. (2013): *Rekonstrukcija arheoloških najdb s pomočjo 3D tehnologij*. Diplomsko delo. Univerza v Mariboru, Fakulteta za strojništvo.

Zanier, K. (2009): La villa maritima di S. Simone a Izola/ Isola (Slovenia). Progetti e interventi per la valorizzazione scientifica e turistica. V: Coralini, A. (ur.): *Vesuviana. Archeologie a confronto*, str. 321–328. Bologna, Ante Quem.

Zanier, K. (2012): Decorazioni parietali nelle ville del Litorale sloveno: considerazioni preliminari. V: Oriolo, F. in M. Verzár-Bass (ur.): *La pittura romana nell'Italia Settentrionale e nelle regioni limitrofe*. Antichità Altoadriatiche, 73, str. 459–460. Trieste, Editreg.

Zanier, K. (2015): L'Istria nord-occidentale in epoca augustea. *Aquileia Nostra*, 86, str. 35–47.

1. Simonov zaliv leta 2005, ortofoto karta proti severu (izdelava: Andrej Grilc, arhiv ZVKDS). V osrednjem delu slike je rtič Korbat z dvema izkopanima območjema stavbe vile, vzhodno (desno) se vije potok Rikorvo; zahodno od stavbe se raztezajo ostaline velikega pristaniščа in pod hribom Kane (na levem koncu slike) je v morju vidna kamnita plo-
ščad, ki jo povezujemo s skladiščnimi objekti.
2. Simonov Zaliv in 2005, orthophoto map facing north (image created by: Andrej Grilc, ZVKDS Archive): the central part of the picture shows the Korbat promontory with the two excavated areas of the villa; the Rikorvo stream winds to the east (on the right); to the west of the building are the remains of a large harbour, while the stone platform visible in the sea below Kane hill (on the left-hand side of the picture) is thought to be associated with the storehouses.

2. Simonov zaliv, rekonstrukcija tlorisa kompleksa vile (izdelava: Avgusta, d. o. o., koordinacija: Janez Rupnik), na temelju izkopanih ostalin in interpretacije rezultatov geofizikalnih raziskav (po Groh, Sedlmayer, 2017: 59, slika 69).
2. Simonov Zaliv, reconstruction of the ground plan of the villa complex (image created by: Avgusta d.o.o., coordination: Janez Rupnik) on the basis of excavated remains and interpretation of the results of geophysical surveying (after Groh, Sedlmayer, 2017: 59, Fig. 69).

3. Simonov zaliv, poskusna digitalna 3D-rekonstrukcija kompleksa vile, pogled proti vzhodu (izdelava: Avgusta, d. o. o., koordinacija: Janez Rupnik): prikazani so pristanišče s skladiščema, stavba na rtiču Korbat, v ozadju sta vidna silhueta nekdanjega izolskega otoka in Viližan.
3. Simonov Zaliv, attempted digital 3D reconstruction of the villa complex, view towards the east (image created by: Avgusta d.o.o., coordination: Janez Rupnik): this view shows the harbour with two warehouses and the building on the Korbat promontory. The former island of Izola and Viližan can be seen silhouetted in the background.

4. Simonov zaliv, poskusna digitalna 3D-rekonstrukcija kompleksa vile, pogled proti vzhodu: prikaz valobrana, bankine in stavbe (izdelava: Avgusta, d. o. o., koordinacija: Janez Rupnik).
4. Simonov Zaliv, attempted digital 3D reconstruction of the villa complex, view towards the east: view of the breakwater, quay and building (image created by: Avgusta d.o.o., coordination: Janez Rupnik).

5. Simonov zaliv, poskusna digitalna 3D-rekonstrukcija kompleksa vile, pogled proti vzhodu: prikaz pristanišča in stavbe (izdelava: Avgusta, d. o. o., koordinacija: Janez Rupnik).
5. Simonov Zaliv, attempted digital 3D reconstruction of the villa complex, view towards the east: view of the harbour and building (image created by: Avgusta d.o.o., coordination: Janez Rupnik).

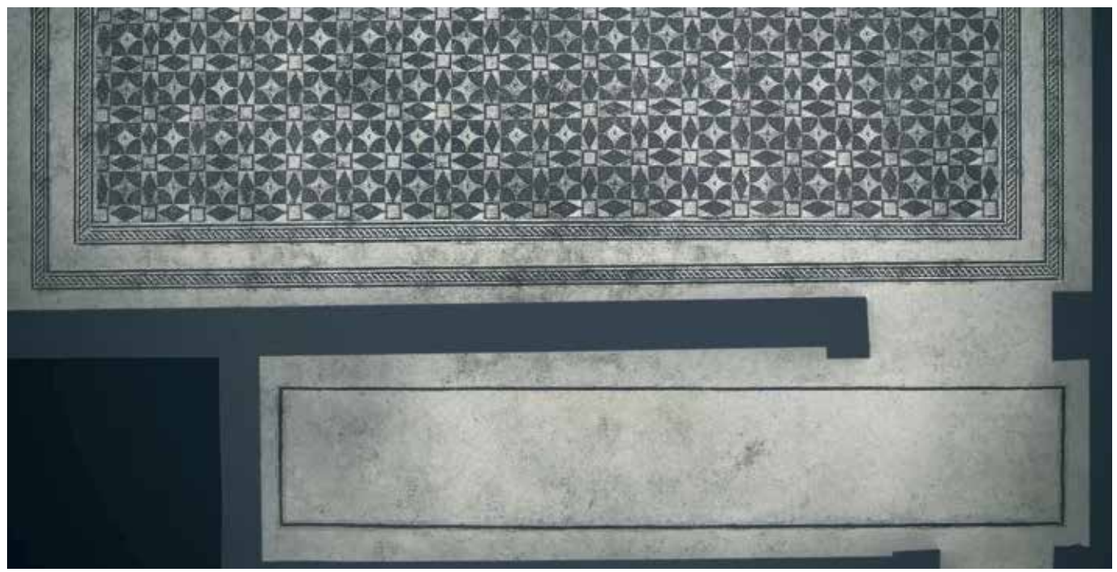
6. Simonov zaliv, poskusna digitalna 3D-rekonstrukcija kompleksa vile, pogled proti jugovzhodu: prikaz stavbe, v ozadju oljčnik in voz (izdelava: Avgusta, d. o. o., koordinacija: Janez Rupnik).
6. Simonov Zaliv, attempted digital 3D reconstruction of the villa complex, view towards the south-east: view of the building, with olive grove and cart in the background (image created by: Avgusta d.o.o., coordination: Janez Rupnik).

7. Simonov zaliv, poskusna digitalna 3D-rekonstrukcija kompleksa vile, pogled proti jugozahodu: prikaz pristanišča in stavbe, vzhodno (levo) vodnjak (izdelava: Avgusta, d. o. o., koordinacija: Janez Rupnik).
7. Simonov Zaliv, attempted digital 3D reconstruction of the villa complex, view towards the south-east: view of the harbour and building; to the east (on the left) is the well (image created by: Avgusta d.o.o., coordination: Janez Rupnik).

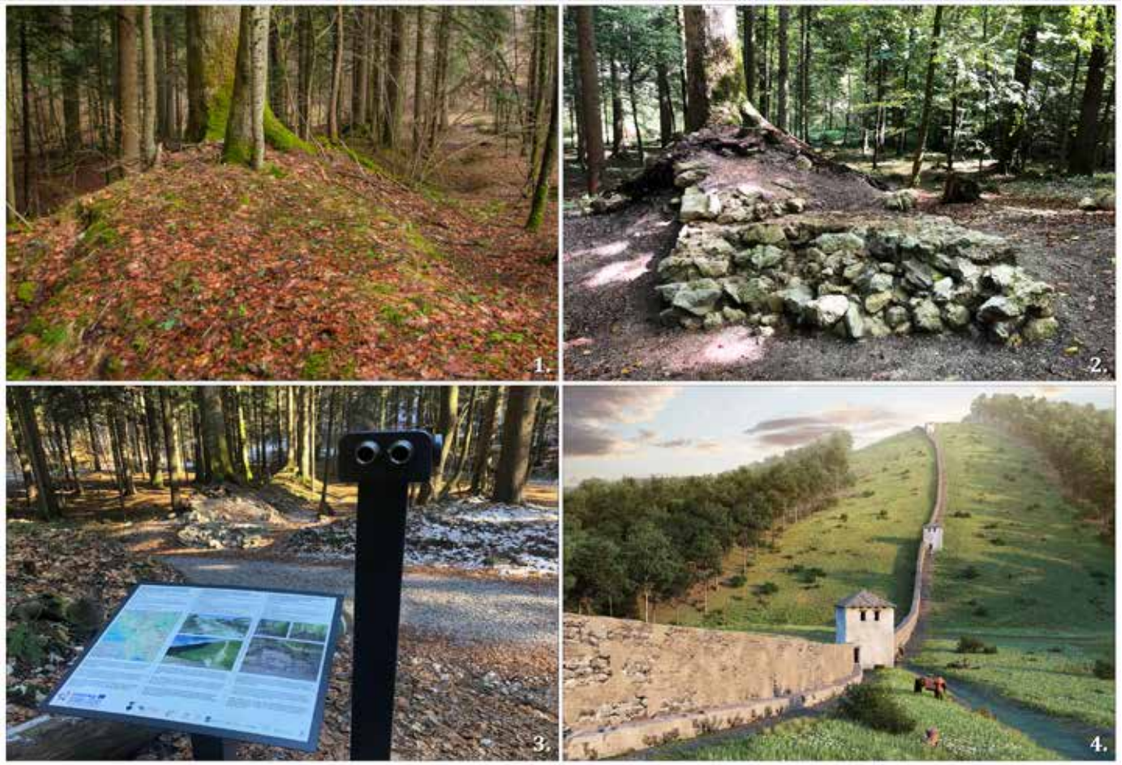
8. Simonov zaliv, poskusna digitalna 3D-rekonstrukcija kompleksa vile, pogled proti severu: prikaz južnega portika (izdelava: Avgusta, d. o. o., koordinacija: Janez Rupnik).
8. Simonov Zaliv, attempted digital 3D reconstruction of the villa complex, view towards the north: view of the south portico (image created by: Avgusta d.o.o., coordination: Janez Rupnik).

9. Simonov zaliv, poskusna digitalna 3D-rekonstrukcija kompleksa vile, prostor 15 (za številke prostorov gl. Stokin, Zanier, 2011: 48, slika 42, ali Groh, Sedlmayer, 2017: 59, slika 69): vključene so dopolnjena fotogrametrija mozaika tega prostora in fotografije stenskih poslikav prostora 15 vile Agripe Postuma v Boscotrecase (izdelava: Avgusta, d. o. o., koordinacija: Janez Rupnik).
9. Simonov Zaliv, attempted digital 3D reconstruction of the villa complex, room 15 (for room numbers see Stokin, Zanier, 2011: 48, Fig. 42 or Groh, Sedlmayer, 2017: 59, Fig. 69): it includes an enhanced photogrammetric model of the mosaic of this room and photographs of the wall paintings of room 15 of the villa of Agrippa Postumus at Boscotrecase (image created by: Avgusta d.o.o., coordination: Janez Rupnik).

10. Simonov zaliv, dopolnjena fotogrametrija mozaikov severnega območja vile oziroma prostorov 16, 17 (severni del) in 20 (izdelava: Avgusta, d. o. o., koordinacija: Janez Rupnik). Dekoracija praga prostora 20 je razstavljena v Pokrajinskem muzeju Koper. Na kraju samem je v sosednjem prostoru 21 vidna kopija mozaika (sicer z drugačno usmeritvijo).
10. Simonov Zaliv, enhanced photogrammetric model of the mosaics of the northern area of the villa, i.e. rooms 16, 17 (north section) and 20. The decoration of the threshold of the last of these rooms is on display at Koper Regional Museum (image created by: Avgusta d.o.o., coordination: Janez Rupnik). A copy of the mosaic (although with a different orientation) is visible at the site itself in room 21.

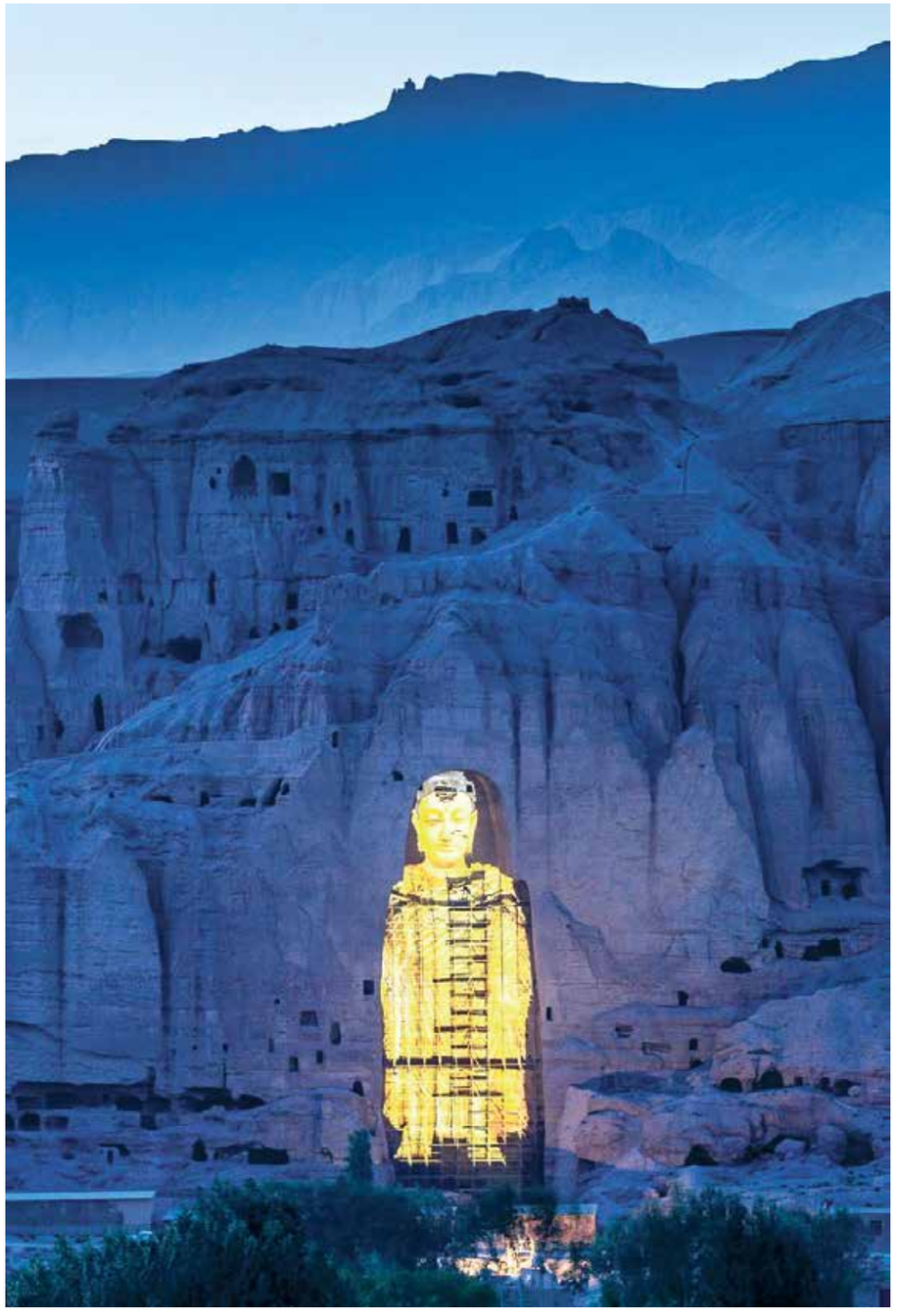


11. Simonov zaliv, dopolnjena fotogrametrija mozaikov južnega območja vile oziroma prostorov 4 in 5 (izdelava: Avgusta, d. o. o., koordinacija: Janez Rupnik).
11. Simonov Zaliv, enhanced photogrammetric model of the mosaics of the southern area of the villa, i.e. rooms 4 and 5 (image created by: Avgusta d.o.o., coordination: Janez Rupnik).



12. Gradišče pri Robu, ostaline obrambnega sistema *Claustra Alpium Iuliarum*: 1. zaporni zid pred izkopavanjem (foto: Andrej Blatnik), 2. po izkopavanju (foto: Tajda Senica), 3. tabla in arheostereoskop pred izkopanimi ostalinami (foto: Tajda Senica), 4. rekonstrukcija prvotnega izgleda zapornega zidu, vidna skozi arheostereoskop (izdelava: Link 3D).
12. Gradišče pri Robu, remains of the Claustra Alpium Iuliarum defence system: 1. the barrier wall before excavation (photo, Andrej Blatnik), 2. the wall after excavation (photo: Tajda Senica), 3. information panel and archaeo-stereoscope in front of the excavated remains (photo: Tajda Senica), 4. reconstruction of the original appearance of the barrier wall, visible through the archaeo-stereoscope (image created by: Link 3D).

13. Kruševac (Srbija), prikaz rekonstrukcije srednjeveške trdnjave kneza Lazarja na pleksiplošči (foto: @Ajn1Stajn, vir: Internet 11).
13. Kruševac (Serbia), reconstruction of the medieval fortress of Prince Lazar visualised on a transparent panel (photo: @Ajn1Stajn, source: Internet 11)



14. Dolina Bamyan (Afganistan), projicirana rekonstrukcija podobe Bude, ki so jo talibani uničili leta 2001 (projekcija: Zhang Xinyu in Liang Hong; foto: Zhang Xinyu/Xinhua Press/Corbis, vir: Marazuela Kim 2015, 49).
14. Bamyan Valley (Afghanistan), projection of the reconstruction of the Buddha statue destroyed by the Taleban in 2001 (projection: Zhang Xinyu and Liang Hong; photo: Zhang Xinyu / Xinhua Press / Corbis, source: Marazuela Kim 2015, 49).

Katharina Zanier

Simonov Zaliv (Izola): Attempted digital 3D reconstruction of a Roman *villa maritima*

Original scientific article
COBISS 1.01

UDC
728.84:902.2(497.4Izola)
7.021.23:728.84(497.4Izola)

Keywords: Roman *villa maritima*, Roman architecture, Roman harbour, Roman cultural landscape, digital 3D reconstruction, virtual archaeology, Izola, Simonov Zaliv

Abstract

In 2021 an attempt was made at a digital 3D reconstruction of the Roman *villa maritima* at Simonov Zaliv (Izola) on behalf of the Izola Tourism Association. The article gives a brief presentation of the Roman villa (including its ground plan, architectural decoration and chronology) and its harbour, and discusses its importance as a tourist attraction. We then focus on the parameters we defined for the reconstruction of the building complex, the harbour and the surrounding area. This is followed by an explanation of the methodology used to create the 3D reconstruction of the villa. After that, we look at the purposes of use of 3D reconstructions and the principles established at the international level for 3D reconstructions, i.e. the Seville Principles. The conclusion assesses the application of these principles in the case of our 3D reconstruction.

Summary

The article presents the attempted digital 3D reconstruction of the Roman *villa maritima* at Simonov Zaliv (Izola), which is a cultural monument of national importance. The site contains the best preserved and most thoroughly investigated remains of a Roman *villa maritima* with harbour in Slovenia. The archaeological and architectural complex lies in an area of five hectares and consists of the partly excavated residential part of the villa situated on a promontory (Rtič Korbat / Punta Corbato), a buried water conduit, a harbour with a quay, jetty and breakwater, and a large area of storehouses or similar.
The nucleus of the villa was built in around 30 BC. Within a few years, by 15 BC, this building was no longer big enough to house the inhabitants of the flourishing complex and their economic activity. Accordingly, in the years between 15 BC and AD 15, the residential part of the villa was enlarged and luxuriously equipped with colonnades, mosaics and wall paintings. The villa remained the same size until 70 BC, at which point the northern section of the building was abandoned. The southern part lived on in a changed, impoverished form until the fourth or fifth century AD, while the harbour existed for even longer.
The Simonov Zaliv site has great tourism potential. A 3D digital reconstruction of the villa was created in 2021 as part of the *Izola – Digital Island* project (at the proposal of the Izola Tourism Association) and is presented here. The reconstruction was prepared for the phase dating from 15 BC to AD 70 (the period in which the villa enjoyed its greatest prosperity) and is based partly on the excavated remains of the villa and partly on the results of geophysical

Dr Katharina Zanier, Assistant Professor, University of Ljubljana, Faculty of Arts, Archaeology Department and Institute for the Protection of Cultural Heritage of Slovenia, Katharina.Zanier@ff.uni-lj.si

surveying. The article details the parameters that were set for the reconstruction. This is followed by an explanation of the methodology used to create the 3D reconstruction of the villa.

Next, we briefly outline the history of development and purposes of use of 3D reconstructions in the cultural heritage field and discuss the principles established at the international level for virtual archaeological reconstructions, namely the International Principles of Virtual Archaeology, otherwise known as the Seville Principles. The conclusion looks at the application of these principles in the light of our experiences with the attempted digital reconstruction of the villa.

Introduction

In 2021, as part of the Izola – Digital Island project, which is co-funded by Slovenia's Ministry of Economic Development and Technology as well as the European Regional Development Fund, an attempt was made at a digital 3D reconstruction of the Roman *villa maritima* at Simonov Zaliv/San Simone (Izola). The contracting entity was the Izola Tourism Association, the project was managed by Arctur d.o.o. and the reconstruction was made by Avgusta d.o.o. with the expert support of a representative of the Archaeology Department of the Faculty of Arts of the University of Ljubljana, who is also the author of this article. The purpose of the attempted digital reconstruction was, in short, touristic. It is important to mention this, since the entire project was focused on a target public of tourists. The article begins with a brief presentation of the Roman villa (including its ground plan, architectural decoration and chronology) and its harbour. We also outline the sequence of projects that have led to a clearly tourism-focused vision of development of the site and, in the final phase, to the implementation of the 3D reconstruction that we present here. We then focus on the parameters we defined for the reconstruction of the building complex, the harbour and the surrounding area. This is followed by an explanation of the methodology used to create the 3D reconstruction of our villa. Next, we briefly outline the history of development and purposes of use of 3D reconstructions in the cultural heritage field and discuss the principles established at the international level for virtual archaeological reconstructions, namely the International Principles of Virtual Archaeology, otherwise known as the Seville Principles. Our conclusion looks at the application of these principles in the light of our experiences with the attempted digital reconstruction of our villa, and we explain some of the alternative solutions we decided to implement.

Brief presentation of the Roman *villa maritima*

The attempted 3D reconstruction was prepared for the Simonov Zaliv archaeological site, a designated cultural monument of national importance (EŠD [unique heritage number] 195). The site contains the best preserved and most thoroughly investigated remains of a Roman *villa maritima* with harbour in Slovenia. The Simonov Zaliv archaeological and architectural complex lies in an area of five hectares and consists of the partly excavated residential part of the villa situated on a promontory (Rtič Korbat / Punta Corbato), a buried water conduit, a harbour with a quay, jetty and breakwater, and a large area of storehouses or similar premises immediately below the hill known as Kane / Canè, where a stone platform is still visible in the sea next to the harbour (Fig. 1) (Stokin, Zanier 2011).

On the Korbat promontory, where the area of the archaeological park is also delimited by a protective fence, only two parts of the larger residential building have been investigated and uncovered to date. These are referred to as Area 1 and Area 2. The complex was probably bounded to the east by the Rikorvo stream (Stokin, Zanier, 2011: 47).

Numerous test trenches have been dug and excavations carried out in the past in Area 1, the central part of the villa. Area 2, the southern portion of the villa with a portico, was for the most part excavated between 1986 and 1991, between 2009 and 2010 and then between 2015 and 2016 as part of the AS project (Stokin, Zanier, 2011; Lazar, 2016a, 2016b; Groh, Sedlmayer, 2017).

As regards the other surfaces of the building complex, for the most part the only information we have comes from geophysical surveying. Simonov Zaliv is a site in which numerous attempts have been made at investigations of this type. The first geophysical survey on the Korbat promontory was carried out in 1970 by the Geological Survey of Slovenia, unfortunately without success (Lapajne, Kelhar, 1970). In 1994 the company Tecno Futur Service from Bomporto (in the province of Modena, Italy) conducted new geophysical measurements. Following measurements made using ground-penetrating radar, ten extremely limited test trenches were implemented. In this case too, the research failed to produce clear results (Tecno Futur Service, 1994; Kajfež, 1995). In 2006 a team led by Branko Mušič of the University of Ljubljana completed a geophysical survey that finally revealed the scale of the architectural remains of the villa on the promontory (Mušič, 2006). The most recent geophysical survey in the wider area of Simonov Zaliv was carried out between 2008 and 2010 by Stefan Groh of the Austrian Archaeological Institute in Vienna, who also carried out further trial trenching (Groh, Sedlmayer, 2008; Groh et al., 2009; Groh, Sedlmayer, 2009; Groh, Sedlmayer, 2017). On the basis of these studies, in other words also taking into account the results of geophysical surveying, Stefan Groh made the first schematic attempt at a 3D reconstruction of the villa in 2010. This was followed in 2012 by a second attempt designed by Marko Stokin and Vida Bitenc.

On the basis of the results of more recent investigations by Stefan Groh, we can outline the basic chronological sequence of the phases of construction of the villa. The parts that form Area 1 represented the oldest nucleus of the villa, built in the last decades BC, while the premises that comprise Area 2 are part of an enlargement of the villa some decades later that ended, at the latest, during the reign of Emperor Tiberius (Groh, Sedlmayer, 2008; Groh et al., 2009; Groh, Sedlmayer, 2009; Stokin, Zanier, 2011; Groh, Sedlmayer, 2017). The two areas also differ slightly in terms of the orientation of their walls, while there are considerable differences in the absolute height of the pavements or mosaics, which in Area 2 are on average 0.56 m lower than in Area 1. The more recent part of the villa (Area 2) is oriented six degrees further west than the older, northern part of the villa (Area 1).

On the basis of the investigations mentioned, we can thus conclude that the nucleus of the villa with harbour at Simonov Zaliv was built in around 30 BC. Within a few years, by 15 BC, this building was no longer big enough to house the inhabitants of the flourishing complex and their economic activity. Accordingly, in the years between 15 BC and AD 15, the residential part of the villa was enlarged and luxuriously equipped with colonnades, mosaics and wall paintings. The villa remained the same size until 70 BC, at which point the northern section of the building was abandoned (Groh, Sedlmayer, 2017: 94–97, 221). The southern part continued to exist in a changed, impoverished form until the fourth or fifth century AD, while the harbour existed for even longer.[1]

The investigated remains of the building show that in this section of the villa notably rich elements of residential architecture survived, including mosaics, wall paintings, porticoes and various capitals of columns. The southern portico was more than 66 m long and joined the harbour section of the complex to the southern parts of the villa. Large rooms with rich mosaic decorations stood along the portico, with a narrow passageway (*fauces*) between them giving access to the inner part of the villa. These rooms were connected to the portico via wide doorways with thresholds made of large stone blocks in which there are recesses for hinges (Stokin, Zanier, 2011: 49).

All the mosaics in the villa are black and white: the most common type are white mosaics bordered with black bands, while modular geometric motifs also appear, particularly in the southern part of the villa. The thresholds were particularly carefully decorated. In the northern part of the villa we find a mosaic threshold depicting a portico consisting of arches decorated with hanging reliefs (*oscilla*) (Stokin, Zanier, 2011: 51–74). Painted fragments of wall plaster contain motifs that for the most part can be classified as belonging to the Third Pompeian Style (miniature aediculae, winged vegetal figures, garlands; cupids depicted using ritual objects; etc.) (Stokin, Zanier, 2011: 85–86). Similar specimens are, in fact, found in the rich repertoire of the Third Style from the Vesuvian region (Bastet, De Vos, 1979), but also in northern Italy and, from the stylistic point of view, above all in the early Third Style paintings of the Augustan *domus* under the San Domenico convent in Imola (Maioli, 1997).

The harbour consists of three parts constructed from large blocks of sandstone: a seawall or quay, designed to protect the soil from erosion, a mole or jetty, and a long breakwater protecting the harbour from wind and waves. The jetty (length: 55 m) and the quay (length: 120 m) are preserved below modern structures. A rectangular structure that was probably built later stood in the angle between the jetty and the quay (Stokin et al., 2008). The breakwater (outside length: 110 m, inside length: 84.2 m), which is clearly visible at low tide, was not conceived as a rubble mound but instead represents an extremely regular structure built of large rectangular blocks; we may therefore conclude that the breakwater was also used as an additional mole or jetty (Stokin et al., 2008; Stokin, Zanier, 2011: 75–78).

The height of the harbour structures at Simonov Zaliv in fact provides a good illustration of the gradual rise in the sea level by 1.60 m over the past 2,000 years (Antonioli et al., 2007; Antonioli et al., 2008). The harbour's favourable position and long breakwater meant that ships could enter it even in strong winds (Degrassi, 1955). Ships of the *myriophorus*, *corbita* and *corbita vinaria* types – up to 25 m long and with a draught of up to 3 m, and capable of carrying up to 1,000 amphoras of wine – could land in the harbour (Viereck 1975: 148–149). It is unlikely, however, that local production of wine, olive oil and other seasonal produce would have been sufficient to justify the construction of such a large harbour (Stokin, 2001: 407). We may therefore conclude that the extensive harbour (8,000 m^2), among the largest on the west coast of Istria at that time, did not only serve the needs of the villa but was rather a distribution centre for the wider area and therefore probably had large warehouses, which we can identify with considerable probability in the south-western part of the bay, where a stone platform with postholes is visible in the sea. Similar remains were also discovered during trenching in the neighbouring area in 2001 (Novšak, 2006: 182; Stokin, Zanier, 2011: 78). The villa was also equipped with an underground aqueduct made of ceramic pipes (Stokin, Zanier, 2011: 79–80).

The coast around Izola is generally rich in Roman-era archaeological finds. Within the present-day town of Izola,

1 The harbour, with added wooden structures, was probably in use at least until the ninth century (Karinja, Čerče, 2008).

Roman finds[2] are known in the area that once formed the island of Izola[3] (ANSl, 1975: 144; Frelih, 1994; Karinja, 2006; Rondič, 2017) and, above all, in the area of Palazzo Manzioli (Frelih, 1994; Rondič, 2017), where another *villa maritima* may have stood. Harbour structures are still visible along the coast at Viližan, while opposite them, on dry land, a Roman building has been investigated (Degrassi, 1955; Boltin-Tome, 1991; Stokin et al., 2008; 67). Numerous Roman-era finds are also known in the Izola hinterland.

The Simonov Zaliv site has great tourism potential, something that was recognised quite early on. The remains of the villa were presented to the public for the first time in the years immediately following Slovenian independence, when conservation-restoration interventions were carried out on the mosaics (Bogovčič, 1994) and a number of educational activities were held, such as summer architecture and archaeology workshops and Latin and archaeology camps. Until 1999, the mosaics were regularly maintained by what was at that time known as the Intermunicipal Cultural Heritage Protection Institute based in Piran, with the help of the Ministry of Culture (Vrzelj, 1993). This was followed by a brief lull.

The beginnings of the first ad hoc valorisation of the site for the purposes of tourism can be traced to the Interreg Slovenia–Croatia project *HEART of Istria – Heritage and Art. Development of cross-border tourist itineraries in urban and rural areas*, implemented between 2005 and 2007 (Darovec et al., 2007; Zanier, 2008). From 2005 onwards, the site (and the nascent archaeological park) was looked after by what was then the Institute for Mediterranean Heritage at the Science and Research Centre of the University of Primorska, which was a partner in the above-mentioned project. In 2010 a tripartite agreement was concluded by the University of Primorska, the Institute for the Protection of Cultural Heritage and the Municipality of Izola (the owner of the site area) as formal basis for management of the site. Since then, the area of the archaeological park has been accessible to the public in the summer season (Lazar, 2011), something that has been made possible also by the financial support received from the Municipality of Izola. The next step in the development of the park was taken by the strategic project *Archaeological Parks of the Northern Adriatic* (*PArSJAd*), which ran from 2010 until 2014 as part of the Slovenia–Italy Cross-Border Cooperation Programme. It was also in this period that the first management plan was drawn up for the park, later to be further updated (Lazar, Zanier, 2012, 2014). It should be noted, however, that the rich mosaics of the villa that had already been discovered were, until recently, covered by protective backfilling (i.e. reburied), which significantly reduced the archaeological park's informativeness and attractiveness. As the manager of the archaeological park and lead partner, the University of Primorska obtained a grant under the EEA Financial Mechanism 2009–2014 for the project *AS – Archaeology for All. Revival of the Simonov Zaliv Archaeological Park* (Lazar, 2016a, 2016b). As part of this project, the walls and mosaics of the villa were conserved and displayed; in this context, the Croatian company Vektra d.o.o. carried out terrestrial laser scanning and photogrammetry of the initial and final states of the mosaics in 2015 (Lesar Kikelj et al., 2018). Awnings were set up to protect the presented remains and a drainage system was implemented. A small interpretation centre was also created at the site. Slovenia's first underwater archaeological park was also created in the area of the harbour (Lazar, 2016a, 2016b). Efforts to conserve the mosaics continue today.

As part of the *Izola – Digital Island* project, co-funded by Slovenia's Ministry of Economic Development and Technology and the European Regional Development Fund, in the context of a public call relating to raising the competences of leading tourist destinations and development of the tourism offering of leading tourist destinations in 2020 and 2021, the new initiative was taken over by the Izola Tourism Association (Internet 1). Among other things, this project saw the creation of new photogrammetric models and the 3D reconstruction that we present here, which has also been included in a broader initiative called *Tourism 4.0 Heritage+* (Internet 2).

Elements and parameters of the 3D reconstruction

For the purposes of the reconstruction, we began by dividing up the area of the *villa maritima* complex at Simonov Zaliv in terms of its essential purposes of use. The results of invasive and non-invasive investigations suggest that the main building of the villa was limited to the area of the Korbat promontory. East of the villa is a well, still present today. Although no elements dating it to the Roman era were uncovered during the investigations (Kajfež, 1995), we have included it in the reconstruction, since wells are very common at Roman-era sites, regardless of whether an aqueduct is simultaneously present (Šavel, Kerman, 2008; Vitasović, 2008; Gaspari, 2010; Cipriano, Pettenò, 2011: *passim*; Jelinčić Vučković, 2015). The reconstruction also envisaged an olive grove in this area, extending as far as the Rikorvo stream, although there are no archaeological remains to confirm the presence of an olive grove in this precise location; olive-growing is, however, a traditional agricultural activity that is generally well documented in Roman Istria (Labud, 1996: 137; Matijašić, 1998; Cipriano, 2009: 176–177; Tassaux, 2009; Zaccaria, 2012; Zanier, 2015: 40)[4]. To the west of the villa lies the harbour, with large warehouses on the south-west side of the bay.

Sandstone paving was determined for the area of the large harbour, while simple wooden structures were suggested for the storehouses, given the archaeologically demonstrated presence of postholes[5]. The presumed route of local roads was determined on the basis of the position of these various sections of the *villa maritima* and other factors. The hypothetical digital reconstruction of the villa was prepared for the phase dating from 15 BC to AD 70. This was the period in which the villa enjoyed its greatest prosperity. As mentioned earlier, the villa has only been partially excavated, but we are partly able to reconstruct its ground plan on the basis of the results of the geophysical surveys carried out by Stefan Groh (Groh, Sedlmayer, 2017: 59, Fig. 69).

For the most part, the excavated walls of the villa only survived at the foundation level, which means that often we do not have information about the precise location of doors, windows, decorative motifs on wall paintings, etc. For this reason, many elements of the digital reconstruction are only assumptions based on comparisons with similar complexes. This applies in particular to the wall paintings, for which we included images of well-preserved contemporary examples of frescoes.

On the ground plan, which combines the excavated structures and those identified through geophysical surveying (Fig. 2), we first defined the unroofed areas or inner courtyards, in each case taking into consideration the shape of the space, its position and available comparisons. We interpreted some small rectangular structures characterising these spaces as pools or nymphaea. The vegetation within the inner courtyards was modelled on Roman gardens, particularly those of the Pompeian area, for which in-depth studies exist, including some based on castings of roots that left cavities in the Vesuvius' ash (Gleason, Jashemski, 2018).

Next, the location of the columns was determined, as derived from the results of excavations or on the basis of the shape of the rooms and comparisons.

The next stage involved determining the height and pitch of the roofs. This is the most conjectural part of the reconstruction, since not much comparative data is available from other sites for roof structures in general, with the exception, of course, of some remarkable examples from the Vesuvian region. It follows from these examples that Roman roof structures were very varied, adapted to specific groups of rooms and designed in such a way as to facilitate not only water run-off but also the collection of water (Centola, 2018). In our case, we envisaged three classes of roof heights, while the pitch or inclination of individual parts of the roof was determined in such a way as to ensure adequate water run-off and collection. The roofs over the colonnades were the lowest, with a height ranging from 3 m at the front edge to 3.5 m at the top, since calculations made using surviving elements of the columns indicated that their height was approximately 3 m (Stokin, Zanier, 2011: 53), in accordance with the ratio between column height and diameter (where in our case the latter figure is around 35 cm), as provided by Vitruvius (in Books III and IV of his work *De architectura)* and numerous surviving examples of Roman columns (Wilson Jones, 1989). Other sections of roof were placed higher (between 4 and 5 m and between 5.5 and 6 m).

We placed the doors where thresholds were found and, additionally, in other locations, especially in the case of structures identified through geophysical surveying. The door leaves were designed in accordance with individual surviving examples of doors from Herculaneum and images from wall paintings (Demetrescu et al., 2016: 57, Fig. 6; Internet 9). The windows were placed in such a way as to guarantee sufficient light for the individual rooms. They are positioned quite high up, something that once again was suggested by examples of residential architecture from the Vesuvian area. For the exterior of the villa and the columns, we opted for basic wall paintings with a red socle under a plain white surface, which represents a frequent solution for exteriors and columns (Internet 7 and 8; cf. Demetrescu et al., 2016: Figs. 8 and 14).

For the interior of the villa, we were able to make use of the photogrammetric models of the mosaics that were, in principle, well preserved. Fragments of wall paintings, on the other hand, were extremely limited and, moreover, for the most part found in a secondary position in recent fill layers. It was therefore not possible to attribute painting fragments to individual rooms. Neither was it possible to reconstruct the paintings of entire walls. Since a schematic, neutral representation of the paintings would have created too great a contrast with the realistic photogrammetric model of the mosaics, we decided to incorporate photographs of well-preserved wall paintings from contemporary structures in the Vesuvian region such as the villa of Agrippa Postumus at Boscotrecase from the last decade of the first century BC (Internet 10).

2 Several Roman inscriptions have also been discovered in Izola, for example CIL V, 482 = InscrIt X.3, 36; CIL V, 497 = InscrIt X.3, 37; CIL V, 483 = InscrIt X.3, 38; Koper Regional Museum, Inv. No. 4116.

3 Izola was an island until the nineteenth century, at which time the narrow channel separating the island from the mainland, to which it was connected by a bridge, was finally filled by accumulated refuse (Bernik, 1968: 104).

4 Other well-documented activities in Istria include winegrowing (Labud, 1995; Matijašić, 1998), sheep farming (Giovannini, 1993; D'Incà, 1994; Ventura et al., 2012), fishing and mariculture (Stokin et al., 2008; Pesavento Mattioli, Carre, 2009: *passim*).

5 A similarly simple roof on wooden supports has been reconstructed for a wine warehouse dating from the first century BC in the Bratislava *oppidum*, a Celtic settlement with strong Roman influences, although of course with a different pitch better suited to snowy conditions and heavy rainfall (Musilová, Minaroviech, 2015: 5, 13, Fig. 14).

Creating the 3D reconstruction

The attempt to digitally reconstruct the *villa maritima* included both fieldwork and computer processing, in order to enhance captured data and all data obtained from previous research.

We used a drone to capture a 360° view or panorama of the immediate surroundings of the villa and the horizon. With the help of LiDAR imaging (© ARSO), we obtained a 3D model of the surrounding area, to which we added the captured panorama with the horizon. Owing to the partly transformed relief (Izola is no longer an island) and modern developments, both agricultural and infrastructural, it was necessary to adapt the surrounding area and remove those elements that do not belong to the Roman era.

We digitally reconstructed the ground plan of the structures and harbour, known from geophysical survey and other previously conducted research, in the light of the above-mentioned parameters. The photogrammetric models of the mosaics provided by Arctur d.o.o. were the basis for the processing and digital completion of damaged parts of the mosaics. As already mentioned, we used photographs of wall paintings from other contemporary structures to show the frescoes in the interior of the villa. We added a representation of vessels in the harbour, placed some basic equipment and crates of cargo on the jetty, and included a cart in the background of the villa to add a little life to the reconstruction.[6] Vessels are also shown on the side of the breakwater, since its regular construction allows us to conclude that, as mentioned earlier, it was also used as a jetty or quay where ships could moor.

The next stage was video processing and animation of the model, where the camera angles and camera movement were defined and the video itself was edited, giving a final duration of 2.09 minutes. Subtitles were then added, along with other information and logos. Subtitles (in Slovene, Italian, English and German) are particularly important in our case, since they include important accompanying explanations. As well as information about the villa itself, we explained specific aspects of the reconstruction and some of the assumptions we made. In other words, the fact that the villa has only been partly excavated and that parts of the walls have only been identified through interpretation of the results of geophysical surveying. We also draw attention to the fact that the locations of doors and, of course, windows are mainly conjectural. It is explicitly stated that we have included images of other well-preserved contemporary examples of frescoes, since reconstruction of the wall paintings on the basis of individual fragments found at the site itself was not possible. In short, the subtitles include an important message about the conjectural nature of numerous aspects of the reconstruction itself.

We used the following software in our work: Blender, Nuke, Houdini and Adobe Creative Suite.

Distribution of the video of the 3D reconstruction of the villa in different languages has taken place via the channels of the Izola Tourism Association for its own purposes (Internet 5). Some views of the reconstruction are shown in Figs. 3–11.

6 For similar images, see the reconstruction of the river port at Aquileia (Internet 6).

Uses of 3D reconstructions in the field of cultural heritage

Before embarking on the digital 3D reconstruction of the *villa maritima* at Simonov Zaliv, we looked more broadly at the various possibilities that reconstructions of this type can offer us, and also at the principles that must be observed when creating them.

Virtual reconstructions in a 3D environment allow us to show objects, architectural complexes and even past environments that today survive in a poor or altered state. It is precisely for this reason that the use of virtual reconstructions is particularly widespread in archaeology, although it is also useful for other cultural heritage disciplines, both for research and conservation/restoration purposes and, above all, in the context of the popularisation of heritage (Stančić, Zanier 2012: 63).

Three-dimensional computer graphical approaches began to flourish in the film and television industry with the first commercial software package from Wavefront Technologies, released in 1984 (Schreibman, Papadopoulos, 2019: 224). The first attempts at digital modelling of archaeological and historical architectural structures appeared at around the same time. Hailed as a remarkable phenomenon (Reilly, 1992, 93–97), these first reconstructions included the Gallo-Roman temple of the goddess Sulis Minerva in Bath (Blagg, 1982; Smith 1985; Lavender et al., 1990; Woodwark, 1991), the baths in the Roman fortress at Caerleon in South Wales (Smith, 1985; Woodwark, 1991), the animated model of the Old Minster of Winchester (Burridge et al., 1989; Reilly, Todd, Walter, 2016) and the computer reconstruction of the largely destroyed third abbey church at Cluny (known as Cluny III) (Cramer, Koob, 1993: 58–103; Messemer 2019: 251). Following these first projects, virtual reconstructions spread into various fields and can be used for a wide variety of different purposes.

In the research field, virtual reconstructions enable the visualisation and test evaluation of various hypotheses. They are thus useful above all for complex heritage contexts where (traditional) graphic reconstruction would be overburdened and less flexible for progressive updating of the model in the course of renewing research data and hypotheses (for more on this, see, for example, Sims, 1997). One example of a special area of virtual reality is represented by three-dimensional facial reconstructions of skeletons and mummies. The development of the modern discipline of facial reconstruction, which has of course achieved special importance within forensic medicine, actually derives from the context of the archaeological problem of identifying famous historical figures, where attempts to establish their identity have been made by comparing a plastically modelled physiognomy based on the conformation of the skull with surviving portraits (Prag, Neave, 1995). Modern procedures envisage the use of medical technologies such as CT scans for the detailed surveying of osteological or, in the case of mummies, physiological remains, even without removing outer coverings (e.g. bandages or even sarcophagi); from a three-dimensional model of the skull, virtual modelling techniques enable reconstructions of the volume (warping) and possible appearance (texture) of the whole face (Betrò et al., 2007).

Virtual reconstructions can also be applied to papyrus scrolls, archival sources and other documents particularly exposed to deterioration. New technologies not only facilitate the digitalisation and flexible archiving of documents, they also permit a virtual restoration intervention that improves the legibility of the content. Some years ago, an international consortium was formed to carry out a project known as *Isyreadet* (*Integrated System for Recovering and Archiving Degraded Tests*) (Console et al., 2006): in the course of this project, a number of especially poorly preserved written documents, selected as test documents, were digitalised using a multispectral camera and processed using various image-enhancing algorithms (independent component analysis, decorrelation methods, anisotropic filters, mathematical morphology). The project demonstrated the advantages of the methodology, even though the use of similar processes is still quite limited. Perhaps the most notable projects in this field have been those dedicated to the virtual unrolling and restoration of scrolls from Herculaneum in order to allow their texts to be read without physically unrolling them, something that in the past had proved to be an unsuccessful and harmful approach. After testing various scanning (micro-CT, XPCT), processing and modelling techniques, virtual approaches have achieved extremely good results (Bukreeva et al., 2016; Stabile et al., 2021).

Virtual restoration is sometimes followed by physical restoration, for which the virtual model can also create an operational application to guide mechanical restoration equipment. Above all, IT-based systems can make the work of the restorer easier in that they enable the automated reassembly of fragments for the potential recomposition of an artefact or, for example, painted plaster, with the help of mathematical algorithms that evaluate, above all, the homogeneity of the fragments and the shapes of the fractures. The project for the restoration of the paintings in the Basilica of St. Francis of Assisi that were destroyed by an earthquake in 1997 is particularly well known: shortly after the event, an IT system capable of digitally manipulating and assembling around 120,000 fragments of plaster was created for the first time, after which the paintings were then actually restored in accordance with the digital model (Basile, 1998; 2009; Limoncelli, 2012: 95). Similar systems have been created for the Bronze Age paintings of Akrotiri (Brown et al., 2008) and Tiryns (Papaodysseus et al., 2012) in Greece, and for Roman wall paintings in Celje (Filipič et al., 2011; Gutman et al., 2015: 786): the Jožef Stefan Institute and the Institute for the Protection of Cultural Heritage of Slovenia developed a specialised computer application called Pedius which allowed the digitalisation and assembly of the fragments. This was followed by the online and mobile application e-Pedius (Internet 4), which is accessible to all interested users.

Perhaps the most widespread use of virtual reality is intended for heritage dissemination: for the better understanding of an individual heritage context, it is important, particularly for the general public, to be able to link an image of the present state of a monument with a reconstruction of its original forms and various phases of development. While "traditional" graphic representations such as drawings are often sufficiently clear, the accessibility of digital reconstructions online and via geolocation systems and mobile applications is incomparably greater. Digital visualisations are also fully adaptable and allow various views and levels of information. They can be updated and enhanced and can incorporate interactive tools and combine a wide range of stimuli. At the same time, such visualisations are suitable for various media and devices for presentation and interpretation. Visualisations created in a digital environment can, just like traditional drawings, be used in printed products (brochures, information panels, etc.) and various static viewers such as stereoscopes and transparent panels (Figs. 12 and 13). Alongside computers, self-standing screens (totems), smartphones and tablets, and 3D projection rooms, we can see VR **headsets** with built-in visualisation devices that allow visitors to walk through a virtually reconstructed site[7]. There are also simpler headsets into which visitors can fit their own smartphone (see e.g. Ray Bibek and Deb, 2016). We should also draw attention to the potential additional possibilities and benefits that such digital reconstructions can offer, such as light projections and holograms, which are slowly but surely gaining ground in the presentation not only of movable but also of immovable heritage (Fig. 14) (Marazuela Kim, 2015). Last but not least, 3D reconstructions can also be connected to the field of 3D printing for the creation of

7 Despite its long history of use, this technology has only spread moderately, probably above all for reasons of hygiene and because headsets of this type are not very adaptable to users with vision defects who wear corrective glasses.

maquettes and miniature models, which could likewise be an important area, above all from the point of view of the inclusion of people with disabilities, especially blind or visually impaired visitors, etc., and perhaps even for the production of souvenirs. The field of virtual archaeology for recreational purposes and cultural tourism must, however, be careful to avoid numerous traps relating, above all, to inconsistencies of content and the concept of relative authenticity (Melotti, 2011, 8–17). For this reason, it is necessary to observe specific principles when creating 3D reconstructions[8].

Principles of 3D reconstructions in archaeology

The first principles in this field were formulated in the London Charter for the Computer-based Visualisation of Cultural Heritage (Beacham, Denard, Niccolucci, 2009), prepared between 2006 and 2009 on the basis of an initiative put forward at a conference held in London and entitled *Making 3D Visual Research Outcomes Transparent* (Internet 3). The London Charter envisaged the development of special Implementation Guidelines (Article 1.1) in individual fields. In the case of archaeology, this took place in 2010 with the drafting of the so-called Seville Principles, more properly known as the International Principles of Virtual Archaeology, which were also adopted by the ICOMOS General Assembly in 2017 (Seville Principles, 2017).

As has already been mentioned, virtual reconstructions have been present in archaeology for some decades and can be used as a suitable alternative to physical reconstructions. Owing to the fragmentary nature of archaeological remains and, in most cases, the shortage of information about the original appearance of buildings or other contexts on the basis of comparisons and other sources, digital reconstructions in the archaeological field are highly complex, while solutions can vary considerably, particularly if we take into account all the possible target groups for reconstructions of this type. The Seville Principles were formulated in order to regulate this important field, while, thanks to the contribution of the Spanish Society of Virtual Archaeology (Sociedad Española de Arqueología Virtual), it has been expanded to the more comprehensive concept of virtual archaeology, in other words "the scientific discipline that seeks to research and develop ways of using computer-based visualisations for the comprehensive management of archaeological heritage." According to the definition contained in the Seville Principles themselves, comprehensive management "includes inventories, surveys, excavation work, documentation, research, maintenance, conservation, preservation, restoration, interpretation, presentation, access and public use of the material remains of the past." The Seville Principles envisage various types of virtual visualisations, these are virtual restoration, virtual anastylosis, virtual reconstruction and virtual recreation, and defines them as follows:

"- Virtual restoration: this involves using a virtual model to reorder available material remains in order to visually recreate something that existed in the past. Thus, virtual restoration includes virtual anastylosis.
- Virtual anastylosis: this involves restructuring existing but dismembered parts in a virtual model.
- Virtual reconstruction: this involves using a virtual model to visually recover a building or object made by humans at a given moment in the past from available physical evidence of these buildings or objects, scientifically reasonable comparative inferences and, in general, all studies carried out by archaeologists and other experts in relation to archaeology and history.
- Virtual recreation: this involves using a virtual model to visually recover an archaeological site at a given moment in the past, including material culture (movable and immovable heritage), environment, landscape, customs and general cultural significance." (Seville Principles, 2017, 3)

There are eight Seville Principles (Seville Principles, 2017, 5–9):

- Principle 1 – Interdisciplinarity: virtual archaeology must be supported by a team of professionals from different branches of knowledge.
- Principle 2 – Purpose: the purpose or goal of virtual archaeological work must be clearly defined and implies different levels of detail, resolution and accuracy; we can distinguish three main categories of activity in virtual archaeology: research, conservation-restoration and interpretation; the last of these is further divided into the educational (formal and informal) and recreational sphere (cultural tourism).
- Principle 3 – Complementarity: "the application of computer-based visualisations for the comprehensive management of archaeological heritage must be treated as a complementary and not alternative tool to more traditional but equally effective management instruments ... (e.g. virtual restoration should not aspire to replace real restoration, just as virtual visits should not aspire to replace real visits)" – except of course in cases where archaeological remains have been destroyed or are not accessible.
- Principle 4 – Authenticity: "computer-based visualisations normally reconstruct or recreate historical buildings, artefacts and environments as we believe they were in the past. For this reason, it should always be possible to distinguish what is real, genuine or authentic from what is not." Alternative virtual interpretations should be made, "provided they afford the same scientific validity. When that equality does not exist, only the main hypothesis will be endorsed."
- Principle 5 – Historical rigour: virtual archaeology "must be supported by solid research, and historical and archaeological documentation."
- Principle 6 – Efficiency: "using fewer resources to achieve steadily more and better results is the key to efficiency."
- Principle 7 – Scientific transparency: "all computer-based visualisations must be essentially verifiable."
- Principle 8 – training and evaluation: as a specific scientific discipline, virtual archaeology "requires specific training and evaluation programmes."

Although the above principles may not seem too demanding or too extensive, in practice it is rare to see them taken fully into account in archaeological 3D reconstructions, which are often presented without adequate accompanying explanations. We ourselves have attempted to observe the principles as consistently as possible, although with some minor deviations, which will also be explained in the conclusion.

Conclusion

In terms of the above definitions of virtual visualisations, we would define our example as an intermediary stage between virtual reconstruction and virtual recreation, since elements of the environment and landscape were also included, while the purpose of use of individual premises was only sporadically indicated by means of specific additions (the crane and crates on the jetty, the ship in the harbour, the cart on the path and the material in the warehouse). Many more possibilities would have been available in this regard, by showing additional elements in the landscape (olive groves, grapevines, flocks of sheep, etc.), on the estate and in the villa complex (fixtures and furnishings), including human figures, which would of course have given life to the model, but these were out of our reach because of the limited resources available. In general terms it may be said that this kind of slightly more creative visualisation is particularly suitable when it comes to archaeological sites, since, for the general public, understanding the architectural forms themselves is often less important than understanding the uses to which individual premises were put, and this is something that can most easily be achieved through the addition of artefacts, crops, animals and individuals performing specific activities. Additions of this type ensure a greater attractiveness of virtual 3D models and motivate viewers to look more closely and reflect on what they are seeing, in other words to interact, which significantly enhances the effects of such tools.

As regards the Seville Principles themselves, we observed the principle of interdisciplinarity (principle 1) as far as the available funds and possibilities allowed. The purpose of our reconstructions was clearly defined (principle 2) in accordance with the wishes of the contracting entity, i.e. the Izola Tourism Association: the reconstruction was designed to enable better interpretation of the site, above all for the recreational purposes of cultural tourism. The entire project was designed in accordance with this objective. It is a "complementary" tool that is available to actual or potential visitors to the site (principle 3).

With regard to the principle of authenticity (principle 4), a minor deviation must be acknowledged in our reconstruction. In our model, it is not in fact possible to distinguish visually what was actually preserved of the villa itself and what was hypothetically reconstructed or merely indicated on the basis of comparisons. The main reason for this is that the greater part of the reconstruction is actually the result of an interpretative hypothesis, since only a part of the ground plan of the villa has been excavated, while the other part was reconstructed on the basis of interpretation of the results of geophysical surveying; the excavated walls were only preserved at the foundation level; and the remains of architectural decoration were likewise extremely meagre, with only individual fragments of painted plaster surviving, while even these were located in a secondary position. It did not seem possible to express all the nuances of the problem and all the limitations in a clear visual form, so we opted instead for an accompanying text in which we explained the special situation and our procedure. We can therefore say that we have put the principle of authenticity into effect with the help of the explanations contained in the subtitles. This decision was also tied to the purpose of the reconstruction, which is already prescribed in connection with principle 2, namely a recreational purpose in the context of cultural tourism.

We observed the principle of historical rigour (principle 5) and created a uniform visualisation of the phase of greatest splendour of the *villa maritima* at Simonov Zaliv. In view of the parameters presented earlier, the reconstruction itself is verifiable and repeatable (principle 7).

In connection with principle 8, training and evaluation in the field of virtual archaeology, we find that this field is only just beginning to be established in Slovenia as a specific field of education. While several bachelor's, master's and doctoral theses in the fields of archaeology, information

8 The need to develop principles for all areas of cultural heritage conservation and management (including interpretation, adaptation and other types of intervention as well as maintenance) is particularly highlighted in the Delhi Declaration on Heritage and Democracy (ICOMOS 2017).

science and architecture have addressed such topics,[9] and a number of workshops[10] and numerous projects[11] have taken place, the range of formal education available in this interdisciplinary field is still underdeveloped. We also see space for improvement in the evaluation of the products of virtual archaeology, which would likewise require the establishment of an exact methodology and criteria with regard to the various purposes of the products themselves and, in projects, a specific cost item.

Generally speaking, the falling prices of data capture and processing equipment and the greater accessibility of software, including free software (Stopinšek et al., 2013, 95–96) have expanded the potentials of virtual archaeology. Given the great popularity and undoubted benefits of virtual archaeology and the increasing accessibility of equipment and software, the introduction of formal education and training in this field would be welcome in Slovenia, since virtual archaeology has long since outgrown the field of heritage interpretation for recreational purposes and can also play an important role in research (in particular in testing hypotheses) and the conservation-restoration profession.

References

ANSl (1975): *Arheološka najdišča Slovenije*. Ljubljana, Slovenska akademija znanosti in umetnosti.

Antonioli, F., Anzidei, M., Lambeck, K., Auriemma, R., Gaddi, D., Furlani, S., et al. (2007): Sea-level change during the Holocene in Sardinia and in northeastern Adriatic (central Mediterranean Sea) from archaeological and geomorphological data. *Quaternary Science Review*, 26, str. 2463–2486.

Antonioli, F., Furlani, S., Lambeck, K., and Stravisi, F. (2008): Archaeological and geomorphological data to deduce sea level changes during the late Holocene in the North-Eastern Adriatic. In: Auriemma, R., and Karinja, S. (ed.): *Terre di mare. L'archeologia dei paesaggi costieri e le variazioni climatiche*, str. 221–234. Trieste, Piran, Università degli studi di Trieste, Pomorski muzej – Museo del mare „Sergej Mašera“ Piran.

Basile, G. (2009): Il digitale nel restauro: un esempio di ricomposizione virtuale assistita nei frammenti del San Matteo di Cimabue dalla volta della Basilica Superiore di San Francesco in Assisi. *DigItalia*, 4(1), str. 24–43.

Basile, G., and Giandomenico, N. (ed.) (1998): *Il cantiere dell'Utopia: notizie dal cantiere dei dipinti in frammenti della Basilica Superiore di San Francesco in Assisi*. Assisi, Sacro convento di San Francesco in Assisi.

Bastet, F. L., and De Vos, M. (1979): *Proposta per una classificazione del terzo stile pompeiano*. Roma, Nederlands Instituut de Rome.

Beacham, R., Niccolucci, F., and Denard, H. (2009): *The London Charter for the computer-based visualisation of cultural heritage*. https://www.londoncharter.org (Version 2.1) (retrieved on 1. 9. 2022).

Bernik, J. (1968): *Organizem slovenskih obmorskih mest: Koper, Izola, Piran*. Ljubljana, Mladinska knjiga.

Betrò, M., Imboden, S., and Gori, R. (2007): Volti per le mummie. La ricostruzione facciale tridimensionale assistita dal calcolatore applicata alle mummie dell'antico Egitto. In: Coralini, A., and Scagliarini Corlaita, D. (ed.): *Ut natura ars: Virtual Reality e archeologia*, str. 91–96. Imola, University Press Bologna.

Blagg, T. F. C. (1982): Reconstructions of Roman decorated architecture: proportions, prescriptions and practices. In: Drury, P. J. (ed.): *Structural reconstruction: approaches to the interpretation of the excavated remains of buildings*, British Archaeological Reports International Series 110, str. 131–151. Oxford, British Archaeological Reports.

Bogovčič, I. (1994): Ostanki antičnih mozaikov in fresk v Simonov zalivu. *Varstvo spomenikov*, 35, str. 7–17.

Boltin-Tome, E. (1989): Arheološke najdbe na morskem dnu slovenske Obale. *Kronika: časopis za slovensko krajevno zgodovino*, 37, str. 6–16.

Brown, B., Toler-Franklin, C., Nehab, D., Burns, M., Dobkin, D., Vlachopoulos, A., et al. (2008): A system for high-volume acquisition and matching of fresco fragments: Reassembling theran wall paintings. *ACM Transactions on Graphics*, 27(3), št. 84.

Bukreeva, I., Mittone, A., Bravin, A., Festa, G., Alessandrelli, M., Coan, P., et al. (2016): Virtual unrolling and deciphering of Herculaneum papyri by X-ray phase-contrast tomography. *Scientific reports*, 6, št. 27227.

Burridge, J. M., Collins, B. N., Gaton, B. N., and Halbert, A. R. (1989): The WINSOM solid modeller and its application to data visualization. *IBM Systems Journal*, 28(4), str. 548–568.

Centola, V. (2018): *I sistemi di copertura nelle domus di età romana*. Doktorska disertacija, Università degli Studi di Padova.

CIL (1863–): *Corpus Inscriptionum Latinarum: consilio et auctoritate Academiae litterarum Borussicae editum*. Berlin, Apud G. Reimerum.

Cipriano, S. (2009): Le anfore olearie Dressel 6B. In: Pesavento Mattioli, S., and Carre, M. B. (ed.): *Olio e pesce in epoca romana: produzione e commercio nelle regioni dell'Alto Adriatico*. Antenor – Quaderni, 15, str. 173–189. Roma, Edizioni Quasar.

Cipriano, S., and Pettenò, E. (2011): *Archeologia e tecnica dei pozzi per acqua dalla pre-protostoria all'età moderna*. Antichità altoadriatiche, 70. Trieste, Editreg.

Console, E., Burdin, V., Cazuguel, G., Legnaioli, S., Palleschi, V., Tassone, R., et al. (2006): Isyreadet: un sistema integrato per il restauro virtuale di documenti antichi. *Annali della facoltà di Benevento*, 12, str. 195–206.

Darovec, D., Panjek, A., Kavrečič, P. (ed.) (2007): *Srce Istre. Poti kulturne dediščine / Heart of Istria. Heritage and art: cultural itineraries*. Koper, Univerza na Primorskem, Znanstveno-raziskovalno središče, Založba Annales.

Degrassi, A. (1955): I porti romani dell'Istria. In: *Anthemon. Studi di Archeologia e di Antichità Classiche in onore di Carlo Anti*, str. 119–169. Firenze, G. C. Sansoni = Degrassi, A. (1957): I porti romani dell'Istria. *Atti e Memorie della Società Istriana di Archeologia e Storia Patria (N. S.)*, 5, str. 24–82 = Degrassi, A. (1962): I porti romani dell'Istria. In: *Scritti Vari di Antichità II*, str. 821–870. Roma, Comitato d'onore.

Demetrescu, E., Ferdani, F., Dell'Unto, N., Leander Touati, A., Lindgren, St. (2016): Reconstructing the original splendour of the House of Caecilius Iucundus. A complete methodology for virtual archaeology aimed at digital exhibition. *SCIentific RESearch and Information Technology*, 6(1), str. 51–66.

D'Incà, C. 2004, Pecore e lana nella decima regio orientale. *Histria Antiqua*, 12, str. 205–216.

Djokić, S. (2012): *Uporaba informacijsko komunikacijskih tehnologij v muzejski komunikaciji*. Diplomsko delo. Univerza v Ljubljani, Filozofska fakulteta.

Erič, M., Solina, F., Perkovič, M., Grosman, D., and Stopinšek, Ž. (2013): *Zajem in obdelava 3D podatkov v podvodni arheologiji*. Portorož, Ljubljana, Zavod za varstvo kulturne dediščine Slovenije. http://eprints.fri.uni-lj.si/2920/ (retrieved on 1. 9. 2022).

Filipic, B., Mlakar, M., Dovgan, E., and Tušar, T. (2011): Razvoj sistema za računalniško podprto evidentiranje in sestavljanje fragmentov stenskih poslikav. *Zbornik 14. mednarodne multikonference Informacijska družba*, str. 45–48. Ljubljana, Institut Jožef Štefan.

Filipović, D. (2022): *Interaktivna vizualizacija arheološkega najdišča v navidezni resničnosti*. Diplomsko delo. Univerza v Ljubljani, Fakulteta za računalništvo in informatiko.

Frelih, M. (1994): *Poročilo o izkopavanjih v hiši Manzioli, Izola*. Unpublished report. Piran, Zavod za varstvo kulturne dediščine Slovenije, Območna enota Piran.

Gaspari, A. 2010, *„Apud horridas gentis ---“. Začetki rimskega mesta Colonia Iulia Emona / Beginnings of the Roman town of Colonia Iulia Emona*. Ljubljana, Muzej in galerije mesta Ljubljana.

Giovannini, A. (1993): L'allevamento ovino e l'industria tessile in Istria. *Atti e Memorie della Società Istriana di Storia Patria*, n.s. 41, str. 7–34.

Gleason, K. L., and Jashemski, W. F. (ed.) (2018): *Gardens of the Roman Empire*. Cambridge, Cambridge University Press.

Groh S., and Sedlmayer, H. (2017): *Otium cum dignitate et negotium trans mare : la villa marittima di San Simone (Simonov zaliv) in Istria (Slovenia)*. Bologna, Ante Quem.

Groh, S., Guštin, M., Lazar, I., and Sedlmayer, H. (2009): Neue Forschungen in der römischen Villa Marittima von San Simone / Simonov zaliv bei Izola, Slowenien. *Archäologie Österreichs*, 20(1), str. 53–57.

Groh, S., and Sedlmayer, H. (2008): Die Grabungen in der Römischen Villa Maritima von San Simone / Simonov zaliv bei Isola / Izola, Slowenien. *Annales, Series Historia et Sociologia*, 18, str. 385–396.

Groh, S., and Sedlmayer, H. (2009): Nuove ricerche nella villa maritima romana di San Simone/Simonov zaliv presso Isola/Izola (Slovenia). *Aquileia Nostra*, 80, str. 233–258.

9 To name but a few examples: Lužnik, 2009; Djokić, 2012; Štuhec, 2012; Zajec, 2013; Jerala, 2017; Mavrič, 2017; Guček Puhar, 2018; Štuhec, 2019; Tomiek, 2020; Filipović, 2022.

10 E.g. the workshop *Capture and processing of 3D data in underwater archaeology* which took place in Portorož from 1 to 5 July 2013 (Erič et al., 2013).

11 Worth highlighting among the projects is Heritage+, in which the partnership for Tourism 4.0 developed a toolkit for the digital innovation of cultural heritage and behalf of tourist destinations around Slovenia. Project activities included the preparation of a Digital Innovation of Cultural Heritage Manual (Straus, Starc Peceny, Ilijaš, 2019) and the drawing up of guidelines for the digitalisation of cultural heritage; Heritage+ workshops were held for the first time in 2020 and 2021 in cooperation with the Ministry of Economic Development and Technology (Internet 2). Cf. also the CONPRA project: Zachar et al., 2017; Tasić et al., 2017

Guček Puhar, E. (2018): *Primerjava 3D modelov paleolitske lesene konice*. Diplomsko delo. Univerza v Ljubljani, Fakulteta za računalništvo in informatiko.

Gutman, M., Kikelj Lesar, M., Kuret, J., and Kramar, S. (2015): Mortar – type identification for the purpose of reconstructing fragmented Roman wall paintings (Celje, Slovenia). *Materiali in tehnologije*, 49(5), 785–790.

ICOMOS 2017: *Delhi Declaration on Heritage and Democracy*. https://www.icomos.org/images/DOCUMENTS/Charters/GA2017_Delhi-Declaration_20180117_EN.pdf (retrieved on 1. 12. 2022).

InscrIt (1931–): *Inscriptiones Italiae*. Roma, La Libreria dello Stato.

Internet 1: https://www.visitizola.com/info/izola-digitalni-otok (retrieved on 1. 9. 2022).
Internet 2: https://tourism4-0.org/heritage/toolkit/ (retrieved on 1. 9. 2022).

Internet 3: https://www.londoncharter.org/history.html (retrieved on 1. 9. 2022).

Internet 4: http://e-pedius.si/ (retrieved on 1. 9. 2022).
Internet 5: https://www.youtube.com/watch?v=84Sj7EPYVPg (retrieved on 1. 9.2022).

Internet 6: https://www.archeomedia.net/udine-lantica-aquileia-rinasce-in-3d/ (retrieved on 1. 9.2022).

Internet 7: https://www.pesaromusei.it/area-archeologica-via-dellabbondanza/ (retrieved on 1. 10. 2022).

Internet 8: http://kosmostudio.altervista.org/domus-romana.html (retrieved on 1. 10. 2022).

Internet 9: https://www.romanoimpero.com/2019/06/le-porte-degli-edifici-romani.html (retrieved on 1. 10. 2022).

Internet 10: https://www.metmuseum.org/art/collection/search/250930 (retrieved on 1. 10. 2022)

Internet 11: https://twitter.com/Ajn1Stajn/status/1470854602669142027/photo/1 (retrieved on 1. 10. 2022)

Jelinčić Vučković, K. (2015): *Rimsko selo u provinciji Gornjoj Panoniji: Virovitica Kiškorija Jug / Roman village in the Province of Upper Pannonia: Virovitica Kiškorija South*. Monografije Instituta za arheologiju, 7. Zagreb, Institut za arheologiju.

Jerala, M. (2017): *Herkulov tempelj in svetišče v Celju: peripterni in psevdoperipterni templji v Sloveniji*. Doktorska disertacija. Univerza v Ljubljani, Filozofska fakulteta.

Kajfež, T. (1995): *Terenski dnevnik SS1/95*. Unpublished report. Piran, Zavod za varstvo kulturne dediščine Slovenije, Območna enota Piran.

Karinja, S. (2006): Nota preliminare sulle ricerche archeologice nella chiesa s. Maria D'Alieto di Isola/Izola. In: Guštin, M., Gelichi, S., and Spindler, K. (ed.): *The heritage of the Serenissima: the presentation of the architectural and archaeological remains of the Venetian Republic*. Annales Mediterranea, str. 19–22. Piran, Znanstveno-raziskovalno središče Koper, Inštitut za dediščino Sredozemlja, Založba Annales.

Karinja, S., and Čerče, P. (2008): The Roman Port at the St. Simon's Bay, Izola. The 1994 rescue excavations. In: Radić Rossi, I., Gaspari, A., and Pydyn, A. (ed.): *Proceedings of the 13th Annual Meeting of the European Association of Archaeologists. Session: Underwater Archaeology*, str. 196–206. Zagreb, Hrvatsko arheološko društvo.

Kikelj Lesar, M., Dolenec, S., Ravnik, M., Škrjanec, N., and Zanier, K. (2018): Rimska obmorska vila v Simonovem zalivu v Izoli (Slovenija): konservatorsko-restavratorski posegi na mozaikih in preliminarni rezultati arheoloških raziskav v sklopu projekta AS (2015–2017) / Roman villa maritima in Simonov Zaliv, Izola (Slovenia): conservation-restoration interventions on mosaics and preliminary results of archaeological investigations in the context of the AS project (2015–2017). *Varstvo spomenikov*, 50, str. 11–50.

Labud, G. (1995): *Ricerche archeologico-ambientali dell'Istria settentrionale: la valle del fiume Risano*. Jonsered, P. Åströms förlag.

Labud, G. (1996): Studio tipologico di reperti anforici rinvenuti nel sito archeologico romano di San Simone (Simonov zaliv), nell'Istria settentrionale. *Opuscula romana*, 20, str. 254–260.

Lapajne, J., and Kelhar, T. (1970): *Geofizikalne raziskave: Simonov zaliv-Izola*. Unpublished report. Ljubljana, Piran, Geološki zavod, Pomorski muzej Sergej Mašera.

Lavender, D., Wallis, A., Bowyer, A., and Davenport, P. (1990): Solid Modelling of Roman Bath. *Science and Archaeology*, 32, str. 20–27.

Lazar, I. (2011): Rimska vila Simonov zaliv: možnosti predstavitve mozaikov = La villa romana nella baia di San Simone. In: Stokin, M., and Dolenec, S. (ed.): *Mozaiki severnega Jadrana*, str. 161–174. Ljubljana, Zavod za varstvo kulturne dediščine Slovenije.

Lazar, I. (ed.) (2016a): *AS – Arheologija za vse: Oživljanje arheološkega parka Simonov zaliv. Priročnik projekta*. Koper, Univerza na Primorskem.

Lazar, I. (2016b): Kratka predstavitev projekta in projektnih sodelavcev. In: Lazar, I. (ed.): *AS – Arheologija za vse. Oživljanje arheološkega parka Simonov zaliv*. Priročnik projekta, str. 8–16. Koper, Univerza na Primorskem.

Lazar, I., and K. Zanier (2012): *Načrt upravljanja za arheološki park Simonov zaliv (2012–2016) EŠD 195. 1*. Elaborat. Piran, Univerza na Primorskem, Znanstveno-raziskovalno središče, Inštitut za dediščino Sredozemlja.

Lazar, I., and K. Zanier (2014): *Načrt upravljanja za arheološki park Simonov zaliv (2012–2016 ter usmeritve 2016–2021) EŠD 195. 1/2*. Elaborat. Piran, Univerza na Primorskem, Znanstveno-raziskovalno središče, Inštitut za dediščino Sredozemlja.

Limoncelli, M. (2012): *Il restauro virtuale in archeologia*. Roma, Carocci.

Lužnik, N. (2011): *Računalniška vizualizacija rimske vile Stari Trogir*. Diplomska naloga. Univerza v Ljubljani, Filozofska fakulteta.

Maioli, M. G. (1997): Intaci dipinti della domus dell'ex convento di S. Domenico ad Imola. In: Scagliarini Corlaita, D. (ed.): *I temi figurativi nella pittura parietale antica (IV sec. a.C. – IV sec. d.C.)*. Atti del Convegno Internazionale sulla pittura parietale antica, str. 233–391. Bologna, University Press Bologna.

Matijašić, R. (1998): *Gospodarstvo antičke Istre, arheološki ostaci kao izvori za prepoznavanje društveno-gospodarskih odnosa u Istri u antici*. Povijest Istre, 4. Pula, Zavičajna naklada ˝Žakan Juri˝.

Marazuela Kim, A. (2015): Re-enchantment and Iconoclasm in an Age of Images. *The Hedgehog Review*, 17(3), str. 48–54.

Mavrič, K., (2017): *Vizualizacija cerkve sv. Vida, Ajba*. Diplomsko delo. Univerza v Ljubljani, Filozofska fakulteta.

Melotti, M. (2011): *The Plastic Venuses: Archaeological Tourism in Post-Modern Society*. Newcastle upon Tyne, Cambridge Scholars Publishing.

Messemer, H. (2019): WissenschaftlicheRezeption digitaler 3D-Rekonstruktionen vonhistorischer Architektur. In: Sahle, P. H. (ed.): *Digital Humanities: multimedial & multimodal*, str. 250–253. Mainz, Frankfurt, Universitäten zu Mainz und Frankfurt.

Münster, S., Friedrichs, K., and Hegel, W. (2018): 3D Reconstruction Techniques as a Cultural Shift in Art History?. *International Journal for Digital Art History*, 3, str. 39–59.

Musilová, M., and Minaroviech, J. (2015): 3D Reconstructions of Roman Buildings from the 1st century BC on the Celtic Hillfort in Bratislava. *International Conference on Cultural Heritage and New Technologies Proceedings*, str. 1–15. Wien, Stadt Archäologie Wien.

Mušič, B. (2006): *Poročilo o geofizikalnih raziskavah v Simonovem zalivu*. Unpublished report. Zavod za varstvo kulturne dediščine Slovenije, Območna enota Piran, Univerza na Primorskem, Znanstveno-raziskovalno središče, Inštitut za dediščino Sredozemlja.

Novšak, M. (2006): Simonov zaliv. *Varstvo spomenikov*, 39–41, str. 181–183.

Papaodysseus, C., Arabadjis, D., Exarhos, M., Rousopoulos, P., Zannos, S., Panagopoulos, M., et al. (2012): Efficient solution to the 3D problem of automatic wall paintings reassembly. *Computers & Mathematics with Applications*, 64(8), str. 2712–2734.

Pesavento Mattioli, S., and Carre, M. B. (ed.) (2009): *Olio e pesce in epoca romana: produzione e commercio nelle regioni dell'Alto Adriatico*. Antenor – Quaderni, 15. Roma, Edizioni Quasar.

Prag, J., and Neave, R. (1995): *Making faces*. London, British Museum Press.

Ray Bibek, A., and Deb, S. (2016): Smartphone Based Virtual Reality Systems in Classroom Teaching –a study on the effects of learning outcome. In: Kumar, V., and Murthy Kinshuk, S. (ed.): *2016 IEEE Eighth International Conference on Technology for Education (T4E)*, str. 68–71. Los Alamitos, Washington, Tokyo, The Institute of Electrical and Electronics Engineers.

Reilly, P. (1992): Three-dimensional modelling and primary archaeological data. In: Rahtz, S., and Reilly, P.(ed.): *Archaeology and the Information Age: A Global Perspective*, str. 92–106. London, New York, Routledge.

Reilly, P., Todd, S., and Walter, A. (2016): Rediscovering and modernising the digital Old Minster of Winchester. *Digital Applications in Archaeology and Cultural Heritage*, 3(2), str. 33–41.

Rondič, D. (2017): *Izolski otok z okolico v antiki : arheološka izkopavanja na območju Manziolijeve palače*. Diplomska naloga. Univerza v Ljubljani, Filozofska fakulteta.

Šavel, I. in Kerman, B. (2008): *Gornje njive pri Dolgi vasi*. Ljubljana, Zavod za varstvo kulturne dediščine Slovenije.

Schreibman, S., and Papadopoulos, C. (2019): Textuality in 3D: three-dimensional (re)constructions as digital scholarly editions. *International Journal of Digital Humanities*, 1, str. 221–233.

Seville Principles (2017): *International Principles of Virtual Archaeology*. http://sevilleprinciples.com/ (retrieved on 1. 9. 2022).

Sims, D. (1997): Archaeological models: pretty pictures or research tools?. *IEEE Computer Graphics and Applications*, 17(1), str. 13–15.

Smith, I. (1985): Romans make a high-tech comeback: Sid and Dora's Bath Show Pulls the Crowd. *Computing*, 27. 6. 1985, str. 7–8.
Stabile, S., Palermo, F., Bukreeva, I., Mele, D., Formoso, V., Bartolino, R., et al. (2021): A computational platform for the virtual unfolding of Herculaneum Papyri. *Scientific reports*, 11(1), št. 1695.

Stančić, H., and Zanier, K. (ed.) (2012): *Heritage Live. Upravljanje dediščine z informacijskimi orodji*. Koper, Univerzitetna založba Annales.

Stokin, M. (2001): Simonov zaliv: antična vila. *Annales, Series Historia et Sociologia*, 11(2), str. 405–412.

Stokin, M., Gaspari, A., Karinja, S., and Erič, M. (2008): Archaeological research of maritime infrastructure of Roman settlements on the Slovenian coast of Istria (1993–2007). In: Auriemma, R., and Karinja, S. (ed.): *Terre di mare. L'archeologia dei paesaggi costieri e le variazioni climatiche*, str. 56–74. Trieste, Piran, Università degli studi di Trieste, Pomorski muzej – Museo del mare „Sergej Mašera" Piran.

Stokin, M., and Zanier, K. (2011): *Simonov zaliv / San Simone*. Vestnik, 23. Ljubljana, Zavod za varstvo kulturne dediščine Slovenije.

Stopinšek, Ž., Berginc, B., Erič, M., and Solina, F. (2013): Uvajanje 3D tehnologij pri varstvu kulturne dediščine. In: Potočnik, B. (ed.): *ROSUS 2013: računalniška obdelava slik in njena uporaba v Sloveniji 2013*. Zbornik 8. strokovne konference, str. 89–97. Maribor, Fakulteta za elektrotehniko, računalništvo in informatiko, Inštitut za računalništvo.

Straus, M., Starc Peceny, U., and Ilijaš, T. (2019): *Digitalno inoviranje kulturne dediščine: priročnik za turistične destinacije*. Nova Gorica, Arctur.

Štuhec, S. (2012): *Dvoinpolrazsežnostna (2,5D) in trirazsežnostna (3D) vizualizacija artefaktov*. Diplomsko delo. Univerza v Ljubljani, Filozofska fakulteta.

Štuhec, S. (2019): *Uporaba trirazsežnostnega dokumentiranja za arheološko analizo stoječe vernakularne arhitekture*. Doktorska disertacija. Univerza v Ljubljani, Filozofska fakulteta.

Tasić, N., Novaković, P. in M. Horňák (2017): *Virtual reconstructions and computer visualisations in archaeological practice*. Ljubljana, Znanstvena založba Filozofske fakultete.

Tassaux, F. (2009): Fullonicae, huileries ou ateliers de salaisons? Interrogations sur quelques sites istrien. In: Pesavento Mattioli, S., and Carre, M. B. (ed.): *Olio e pesce in epoca romana: produzione e commercio nelle regioni dell'Alto Adriatico*. Antenor – Quaderni, 15, str. 101–111. Roma, Edizioni Quasar.

TecnoFuturService (1994): *Indagini G.P.R. per la definizione di strutture sepolte nell'area archeologica di San Simone – Isola (Slovenia)*. Unpublished report. Piran, Zavod za varstvo kulturne dediščine Slovenije, Območna enota Piran.

Tomiek, K. (2020): *Uporaba sodobnih metod zajema in obdelave podatkov za umeščanje virtualnih objektov v prostor*. Magistrsko delo. Univerza v Mariboru, Fakulteta za gradbeništvo, prometno inženirstvo in arhitekturo.

Ventura, P., Giovannini, A., and Petrucci, G. (2012): L'allevamento ovino e la lavorazione della lana nella parte orientale della X Regio: resti architettonici, testimonianze materiali, archeozoologia. In: Busana, St., and Basso, P. (ed.), *La lana nella Cisalpina romana. Economia e società*, str. 171–194. Padova, Padova University Press.

Verzel, D. (1993): *Terenski dnevnik konservatorskih del*. Unpublished report. Piran, Zavod za varstvo kulturne dediščine Slovenije, Območna enota Piran.

Viereck, H. D. L. (1975): *Die Römische Flotte: Classis Romana*. Herford, Koelhlers Verlagsgesellschaft.

Vitasović, A. (2008): Opskrba vodom i rimski vodovod na brdu Gradina na otoku Veliki Brijun. *Histria Archaeologica*, 37, str. 47–82.

Wilson Jones, M. (1989): Designing the Roman Corinthian Order. *Journal of Roman Archaeology*, 2, 1989, str. 35–69.

Woodwark, J. R. (1991): Reconstructing history with computer graphics. *IEEE Computer Graphics and Applications*, 11(1), str. 18–20.

Zaccaria, C. (2012): Un nuovo duoviro della colonia romana di Tergeste e la produzione di olio nell'Istria settentrionale. In: Demougin, S., and Scheid, J. (ed.): *Colons et colonies dans le monde romain*. Collection de l'École française de Rome, 456, str. 107–121. Roma, École française de Rome.

Zachar, J., Novaković, P. in M. Horňák (2017): *3d Digital Recording of Archaeological, Architectural and Artistic Heritage*. Ljubljana, Znanstvena založba Filozofske fakultete.

Zajec, L. (2013): *Rekonstrukcija arheoloških najdb s pomočjo 3D tehnologij*. Diplomsko delo. Univerza v Mariboru, Fakulteta za strojništvo.

Zanier, K. (2009): La villa maritima di S. Simone a Izola/Isola (Slovenia). Progetti e interventi per la valorizzazione scientifica e turistica. In: Coralini, A. (ed.): *Vesuviana. Archeologie a confronto*, str. 321–328. Bologna, Ante Quem.

Zanier, K. (2012): Decorazioni parietali nelle ville del Litorale sloveno: considerazioni preliminari. In: Oriolo, F. in M. Verzár-Bass (ed.): *La pittura romana nell'Italia Settentrionale e nelle regioni limitrofe*. Antichità Altoadriatiche, 73, str. 459–460. Trieste, Editreg.

Zanier, K. (2015): L'Istria nord-occidentale in epoca augustea. *Aquileia Nostra*, 86, str. 35–47.

Rok Filipčič

Varovanje kulturne dediščine v času oboroženih konfliktov

Strokovni članek
COBISS 1.04

UDK
719:316.485.26

Ključne besede: kulturna dediščina, oboroženi konflikt, uničenje, pravno varstvo, sodna praksa.

Izvleček

Prispevek predstavlja pomen varovanja kulturne dediščine med oboroženim konfliktom. Kulturna dediščina je bila praktično v vsej zgodovini vojskovanja med oboroženimi konflikti deležna poškodovanja ali uničenja. Če k temu dodamo še plenjenje, je (negativna) slika odnosa do kulturne dediščine popolnejša. V 16. stoletju so se pričele pojavljati zamisli, da je spomenike in umetniška dela med vojno treba zaščititi. Na osnovi razsvetljenskih mislecev in njihovih naslednikov se je razvila pravna zaščita kulturne dediščine v času oboroženih konfliktov, kot jo poznamo danes. V prispevku avtor predstavi zgodovino razvoja varovanja kulturne dediščine ter dve kazenski sodbi mednarodnih sodišč, s katerima sta bila obsojena posameznika, kriva uničenja kulturne dediščine.

Uvod

Kulturna dediščina so dobrine, podedovane iz preteklosti, ki jih posamezniki opredeljujejo kot odsev in izraz svojih vrednot, identitete, verskih in drugih prepričanj, znanja in tradicije. Vključuje vidike okolja, ki izhajajo iz medsebojnega vplivanja med ljudmi in prostorom skozi čas.[1]

Izkušnje kažejo, da kultura in kulturna dediščina igrata pomembno vlogo v modernih konfliktih. Tako rekoč v živo smo lahko spremljali uničenje Starega mostu čez reko Neretvo v Mostarju, bombardiranje starega dubrovniškega mestnega jedra, uničenje antične Palmire ali znamenitih kipov Bude iz Bamiyana. Uničenje dediščine lahko pretrga povezave s preteklostjo in posledično izbriše identiteto iz zgodovinskega spomina.

Toda uničevanje in plenjenje kulturnih dobrin med oboroženimi konflikti nista sodoben izum, stara sta ravno toliko, kot je stara vojna. Eno najstarejših omemb odnosa antičnih civilizacij do kulturnih dobrin v času vojne najdemo v Stari zavezi. V Pravilih vojne v 5. Mojzesovi knjigi je zapisano: »Le ženske, otroke, živino in vse, kar je v mestu, ves plen v njem zapleni zase in uživaj plen svojih sovražnikov, ki ti ga da GOSPOD, tvoj Bog!« (Sveto pismo stare in nove zaveze, 2016: 210) Po zatrtju babilonske vstaje je perzijski kralj Kserks I. pričel sistematično uničevati simbole babilonske identitete. Med drugim je uničil tempelj Esagila, posvečen bogu Marduku, zavetniku Babilona. Herodot Kserksu I. pripisuje tudi oplenitev in uničenje atenske Akropole ter samih Aten (Turku, 2018: 31–32). V času prve judovsko-rimske vojne, ki je potekala med letoma 66 in 73 n. š., so rimske vojaške enote pod poveljstvom kasnejšega cesarja Tita Flavija uničile velik del Jeruzalema in tempelj. Po Titovi smrti je bil v spomin nanj v Rimu zgrajen Titov slavolok, na katerem so upodobljeni vojaki, ki odnašajo plen iz jeruzalemskega templja. S plenom, pridobljenim v tej vojni, je bila financirana izgradnja rimskega Koloseja (prav tam: 33). Med Napoleonovimi osvajanji je potekalo sistematično plenjenje umetniških del premaganih držav. Tudi v novejšem času so bili naši predniki priča uničevanju kulturne dediščine. Med prvo svetovno vojno so bile med drugim uničene katedrala v Reimsu, univerza in knjižnica v Louvainu, večkrat so bile bombardirane Benetke. Med drugo svetovno vojno uničeni samostan Monte Cassino pa verjetno predstavlja simbol uničenja kulturnih dobrin med oboroženim konfliktom.

Poskusi zaščite kulturne dediščine

Dolga stoletja je veljalo, da so za dosego cilja vojne, dokler je cilj pravičen, dovoljena vsa sredstva. Vsa lastnina nasprotnika je lahko bila uničena, če je to pripomoglo k vojaški zmagi. V to je bilo vključeno tudi uničevanje civilne lastnine. V 16. stoletju so se pričele pojavljati zamisli, da so spomeniki in umetniška dela posebna kategorija lastnine, ki jo je med vojno treba zaščititi. Nekateri razsvetljenski pravniki so menili, da uničevanje kulturnih objektov skoraj nikoli ni upravičevalo vojaškega cilja. Hugo Grotius je menil, da je norost uničiti objekte, kot so spomeniki, kolonade in podobni predmeti umetniške vrednosti, katerih uničenje niti ne oslabi sovražnika niti ne koristi tistemu, ki jih je uničil (Grotius, 2005: 1446). Verjetno najbolj konkreten je bil Emer de Vattel, ki je v svojem delu Le Droit de Gens, ou Principes de la Loi Naturelle zapisal, da mora napadalec ne glede na razloge, zaradi katerih opustoši državo, prizanesti zgradbam, ki slavijo človeka in ki ne pripomorejo k sovražnikovi moči, kot so templji, grobnice, javne zgradbe in druga umetniška dela. Kaj lahko pridobimo s tem, da jih uničimo? Le zagrizen sovražnik človeštva lahko ljudi brezskrbno prikrajša za takšne spomenike (O'Keefe, 2006: 11). Tedaj pa še ni veljala posebna misel, namenjena zaplembi nasprotnikovega premoženja, do katerega je imel po veljavnem mednarodnem pravu zmagovalec vso pravico. Francoska revolucija in napoleonske vojne predstavljajo prelomnico v pravni zaščiti spomenikov in umetniških predmetov. Strasti, ki jih je razvnela francoska revolucija, so pomenile veliko nevarnost za francoska umetniška dela. Leta 1790 je bila ustanovljena posebna komisija, ki je prevzela skrb za zaplenjeno kulturno dediščino plemstva, Cerkve in emigrantov, dediščino, ki je bila poslej last vseh (prav tam: 13–14). Tudi nekoliko kasneje izdani dekreti, ki so opredeljevali uničenje ostankov predrevolucionarnega despotizma, so kot izjemo predvidevali umetniška dela velike vrednosti. Izven Francije pa je Napoleonova osvajanja spremljalo sistematično plenjenje umetniških del premaganih držav. Francoska država je deloma s silo, deloma pa z izsiljenimi pogodbami napolnila Museé Central des Arts (Senković, 2013: 4). Inspiracija za ta dejanja je bila vizija panevropske kulture, katere najprimernejši skrbnik bi bila Francija, republika med tiranijami. Omenjena vizija je navdihnila tudi kritike francoskih plenjenj. Antoine Quatermeré de Quincy je objavil več javnih pisem in v njih obsodil plenjenje umetniških zakladov v Italiji. Menil je, da umetnost in znanost pripadata celotni Evropi in ne le enemu narodu (O'Keefe, 2006: 15). Po padcu Napoleona je bila Franciji ukazana vrnitev zaplenjenih del.

Pravna zaščita kulturne dediščine

Medtem pa je na drugem koncu Atlantika vzpostavljajoče se načelo, da so umetniška dela del skupne dediščine človeštva in da kot taka uživajo poseben status, dobilo potrditev v sodbi britanskega pomorskega sodišča v Novi Škotski. Sodišče je ukazalo vrnitev umetniških del, ki jih je angleška mornarica zaplenila med anglo-ameriško vojno leta 1812 (prav tam).

Lieberjev kodeks

Prva kodifikacija vojnega prava, Generalni ukaz št. 100 oz. Lieberjev kodeks, ki ga je predsednik Lincoln izdal med ameriško državljansko vojno, vsebuje tudi prva pravila, posvečena varovanju kulturnih dobrin. Člen 35 govori, da morajo biti klasična umetniška dela, knjižnice, znanstvene zbirke ali dragoceni inštrumenti kot tudi bolnišnice zaščiteni tudi, če so v utrjenih mestih med obleganjem ali bombardiranjem (internet 1). Lieberjev kodeks je vplival na Bruseljsko deklaracijo iz leta 1874 ter na Oxfordski priročnik iz leta 1880, ki sta prepovedovala uničenje nasprotnikove lastnine, če to ni zahtevala vojaška nujnost.

1 Povzeto po definiciji dediščine iz drugega odstavka prvega člena Zakona o varstvu kulturne dediščine (ZKVD-1), ki je bil sprejet 1. 2. 2008. Konvencija o varstvu kulturnih dobrin v primeru oboroženega spopada (Haaška konvencija) uporablja termin kulturne dobrine; za te šteje:

a) premičnine ali nepremičnine, ki so pomembne za kulturno dediščino vsakega naroda, kot so arhitekturni, umetnostni ali zgodovinski spomeniki, verski ali posvetni spomeniki, arheološka območja, skupine zgradb, ki so kot celota zgodovinsko ali umetnostno zanimive, umetnine, rokopisi, knjige in drugi umetnostno, zgodovinsko ali arheološko zanimivi predmeti ter znanstvene zbirke in pomembne zbirke knjig, arhivov ali reprodukcije prej naštetih del;
b) stavbe, katerih poglavitni in stvarni namen je, da varujejo ali razstavljajo premične kulturne dobrine, opredeljene v odstavku a), kot so muzeji, velike knjižnice, arhivska skladišča in tudi zaklonišča, namenjena zavarovanju v odstavku a) opredeljenih premičnih kulturnih dobrin ob oboroženem spopadu;
c) središča, v katerih je znatno število kulturnih dobrin, ki so navedene v odstavkih a) in b), tako imenovana spomeniška središča.

Rok Filipčič, višji kustos, Vojaški muzej Slovenske vojske, Maribor, rok.filipcic@mors.si

Druga (1899) in Četrta (1907) haaška konvencija

Prvi mednarodni pogodbi, ki sta bili namenjeni tudi zaščiti kulturne dediščine med oboroženim spopadom, sta bili Druga in Četrta haaška konvencija o zakonih in običajih vojne na kopnem, s pripadajočima pravilnikoma iz leta 1899 in leta 1907 (Keane, 2004: 4).

Člen 27 pravilnika iz leta 1907 določa, da je med obleganjem in bombardiranjem treba storiti vse, da se zaščitijo objekti, namenjeni veri, umetnosti, znanosti ali dobrodelnim dejavnostim, zgodovinski spomeniki, bolnišnice in kraji, kjer so zbrani bolni in ranjeni, če ti objekti niso uporabljeni v vojaške namene. Isti člen napadenemu nalaga dolžnost, da z očitnimi in jasno vidnimi znaki označi zaščitene zgradbe ter o tem obvesti nasprotnika (internet 2). Pravilnik ne govori o tem, kako naj bi bil videti tak znak. Opisan je v Haaški konvenciji o bombardiranju s strani pomorskih sil v času vojne iz leta 1907.[2] Omeniti pa je treba tudi točko g 23. člena pravilnika, ki dovoljuje uničenje sovražnikove lastnine, torej tudi kulturne dobrine, v primeru vojaške nujnosti (internet 2). Haaški pravilnik tako očitno prepoveduje samo bombardiranje zgoraj naštetih objektov in zgodovinskih spomenikov, vse druge oblike napada na takšne objekte pa so dovoljene. Pravilnik govori tudi o zaščiti kulturne dediščine med okupacijo. V 56. členu je zapisano, da je lastnina institucij, namenjenih veri, dobrodelnosti, izobraževanju, umetnosti in znanosti, zasebna lastnina tudi v primeru, ko gre za last države. Vsako plenjenje, uničenje ali namerno poškodovanje lastnine teh institucij, zgodovinskih spomenikov in umetniških del je prepovedano in bo predmet pravdnih postopkov (prav tam).

Določila Haaškega pravilnika o zakonih in običajih vojne na kopnem so postala pravila običajnega prava in kot taka še veljajo. Pravilnik je vzpostavil tri načela glede zaščite kulturne dediščine. Kulturni spomeniki in objekti, namenjeni znanosti in umetnosti, ki morajo biti označeni z vidnimi znaki, so zaščiteni pred vojaškim napadom, razen v primeru, ko so uporabljeni za vojaški namen. Takšna zaščita je podrejena vojaški nujnosti. V primeru okupacije mora biti kulturna dediščina obravnavana kot zasebna lastina; okupant je ne sme poškodovati, uničiti ali zapleniti (Senković, 2013: 7).

Svetovni vojni

Prva svetovna vojna je izpostavila neustreznost pravila o bombardiranju, zapisanega v 25. členu Haaškega pravilnika o zakonih in običajih vojne na kopnem, ki prepoveduje vsakršen napad na nebranjene kraje in vasi ali njihovo bombardiranje (internet 2). Zaradi tehnološkega napredka različnih tipov orožja je bilo lahko praktično vsako mesto v zaledju fronte izpostavljeno zadetkom nasprotnikovega topništva ali letalstva. In zaradi visoke stopnje vojaške mobilizacije so bile vojaške enote nastanjene tudi v krajih v zaledju fronte in v nekem širšem smislu so bili ti kraji tudi branjeni. Posledično je bila vsa zasebna lastnina, z izjemo kulturnih dobrin, ki jih je varoval 27. člen Haaškega pravilnika o zakonih in običajih vojne na kopnem, izpostavljena legalnemu napadu. Žal pa napredku v razvoju orožja ni sledil napredek v natančnosti obstreljevanja. Zato je vsaka kulturna dobrina v branjenem kraju lahko postala posredni objekt napada. Tako je bila marca 1918 uničena pariška cerkev svetega Gervazija iz trinajstega stoletja (O'Keefe, 2006: 37).

Kot je bilo že omenjeno, je prva svetovna vojna pokazala, da so bila pravila o bombardiranju preohlapna. Komisija pravnikov, ki jo je leta 1922 imenovala Washingtonska konferenca o zmanjševanju oboroževanja, je pripravila osnutek pravil o zračnem bojevanju, ki je bil sprejet leto kasneje (Senković, 2013: 8). V osnutku je razlikovanje med branjenimi in nebranjenimi kraji nadomestilo razlikovanje med vojaškimi objekti in civilnim prebivalstvom. Člen 1 govori o tem, da je zračno bombardiranje legitimno le, če je usmerjeno na vojaški cilj. Osnutek je zavezal vojaške poveljnike, da morajo storiti vse, kar je v njihovi moči, da se prizanese stavbam, namenjenim znanosti, umetnosti ..., in zgodovinskim spomenikom (O'Keefe, 2006: 45). Osnutek ni nikoli dobil formalne potrditve, saj ga je prehitela druga svetovna vojna, bil pa je osnova za nadaljnjo zaščito kulturnih dobrin.

Roerichov pakt

Napredek na tem področju je pomenil tudi Roerichov pakt, ki predvideva nevtralnost zgodovinskih objektov. Ta je lahko kršena le v primeru, ko se ti objekti uporabljajo za vojaške namene. Pakt uvaja tudi razpoznavni znak – rdeča krožnica na beli podlagi s tremi rdečimi krogi znotraj krožnice – za označevanje zaščitenih objektov (internet 3). Roerichov pakt je podpisalo deset ameriških držav, ki so ga kasneje tudi ratificirale. Sporazum, ki je med državami pogodbenicami še vedno v uporabi, je močno vplival na nastanek Haaške konvencije.

Druga svetovna vojna se je pričela ob zelo neugodnem času za nadaljnji razvoj zaščite kulturnih dobrin. Vojaška nujnost, ki je še vedno imela prednost pred zaščito kulturnih dobrin, je vplivala na uničenje številnih mestnih središč ter posameznih zgodovinskih spomenikov velike vrednosti za celotno človeštvo. Najbolj znan primer, morda celo simbol uničenja kulturne dediščine med drugo svetovno vojno je bombardiranje benediktinskega samostana Monte Cassino. Nemška obrambna črta je potekala v bližini samostana, a nemške sile samega samostana niso zasedle. Zaradi napačnih obveščevalnih podatkov, da samostan uporablja nemška vojska, je zavezniški general Freyber ukazal bombardiranje poslopja. Ruševine samostana so nato zasedle nemške enote in jih spremenile v utrdbo, ki je zavezniškim vojakom ni uspelo zavzeti vse do umika nemških enot.

Staro mestno jedro Varšave je primer vojnega uničenja in kasnejše obnove mestnega središča. Uničenje Varšave je bilo tolikšno, da bi ga lahko primerjali z uničenjem Kartagine v tretji punski vojni (Kuznicki, 2013). Načrti o uničenju Varšave in njenem preoblikovanju v nemško mesto so bili pripravljeni že pred začetkom druge svetovne vojne. Varšavska vstaja, ki se je začela avgusta 1944, pa je Nemcem dala povod, da dokončno uničenje tudi izvedejo. Novembra 1944 je bilo 100.000 preživelih prebivalcev Varšave izgnanih, ustanovljeni so bili posebni uničevalni oddelki in pripravljeni seznami najpomembnejše poljske dediščine, ki naj bi bila uničena prva (prav tam). Temu je sledilo uničenje ostalih javnih in zasebnih zgradb. Vsaka zgradba je bila najprej zažgana, njeni ostanki pa še razstreljeni. Varšava je bila osvobojena januarja 1945 in ocenjuje se, da je bilo uničeno približno 85 % starega mestnega jedra (Kane, 2011: 16). Odločitev za obnovo varšavskega starega mestnega jedra je bila sprejeta kmalu po osvoboditvi mesta. Poljaki so na ta način obnovili tudi svojo kulturno identiteto (Omilanowska, 2016: 32). Obnova porušene in uničene Varšave se je bolj ali manj zaključila konec petdesetih let 20. stoletja, posamezna dela pa so potekala še v naslednjih desetletjih.

Kulturni dediščini pa ni grozila le nevarnost uničenja med vojaškimi spopadi. Nemške vojaške enote so z območij pod svojo okupacijo prepeljale v Nemčijo številna umetniška dela. Zavezniške enote so ob koncu vojne odkrile več sto skladišč, polnih umetniških del. Mednarodno sodišče za vojne zločine v Nürnbergu je Alberta Rosenberga, vodjo posebne enote Einsatzstab Rosenberg, katere naloga je bila obogatitev nemških umetniških zbirk, obsodilo na smrt za vojne zločine in zločine proti človeštvu. Smrtna kazen je bila izvedena 16. oktobra 1946 (Keane, 2004: 12). Proces proti Rosenbergu in nekaterim drugim nacističnim veljakom, ki so bili obsojeni za plenjenje kulturnih dobrin, velja za prvo resno mednarodno uveljavljanje pravne zaščite kulturnih dobrin (Gottlieb, 2020: 293).

Haaška konvencija

Leta 1949 je Organizacija Združenih narodov za izobraževanje, znanost in kulturo[3] pričela pripravljati nov dogovor o zaščiti kulturnih dobrin v času oboroženih spopadov. Leto kasneje je generalni direktor sklical delovno skupino, ki je pripravila osnutek pogodbe. Med 21. aprilom in 14. majem 1954 je v Haagu na Nizozemskem potekala medvladna konferenca, na kateri so sodelovale delegacije 56 držav. Štirinajstega maja 1954 sta bila sprejeta Konvencija o varstvu kulturnih dobrin v primeru oboroženega spopada, s pravilnikom za izvrševanje konvencije, ki je integralni del Haaške konvencije, ter Protokol k Haaški konvenciji, danes poznan kot Prvi protokol. Oba dokumenta sta začela veljati 7. avgusta 1956 (O'Keefe, 2006: 93–94). V preambuli Haaške konvencije je zapisano: »/.../ kulturnim dobrinam prizadeta škoda ne glede na to, kateremu narodu pripadajo, pomeni oškodovanje kulturne dediščine vsega človeštva, saj prispeva vsak narod k svetovni kulturi svoj delež« (internet 4). Haaška konvencija je prvi mednarodni sporazum, ki govori izključno o zaščiti kulturnih dobrin med oboroženim konfliktom. Razdeljena je na osem delov. Prvi govori o splošnih določbah o varstvu, drugi del o posebnem varstvu, tretji del o prevozu kulturnih dobrin, četrti del o osebju, peti del o spoznavnem znaku, šesti del o področju uporabe konvencije, sedmi del o izvajanju konvencije, osmi del pa o končnih določbah. Najpomembnejši je 4. člen Haaške konvencije. Z njim so se države pogodbenice zavezale, da bodo v času oboroženega spopada spoštovale tako kulturne dobrine, ki so na njihovem ozemlju, kot tiste na ozemlju drugih držav pogodbenic (prav tam). Člen 16 Haaške konvencije opredeljuje znak konvencije. Ta ima obliko ščita, ki je spodaj priostren, razdeljen na štiri navzkrižna polja, obarvan modro in belo (ščit je sestavljen iz modrega kvadrata, katerega eden od oglov predstavlja spodnji del ščita, in iz modrega trikotnika nad kvadratom, tako da oba skupaj z obeh strani omejujeta po en bel trikotnik) (prav tam).[4]

Haaška konvencija ni izpolnila velikih pričakovanj ob njenem nastanku. Razlogov za to je več. Zaščita, ki jo je zagotavljala kulturnim dobrinam, je predstavljala le majhen napredek glede na omejitve bojevanja, veljavne do njenega nastanka. Režim posebnega varstva se je izkazal za neuporabnega. Enako sistem mednarodnega nadzora, ki je bil preambiciozen in zato neuresničljiv. S sprejetjem Dopolnilnih protokolov k ženevskim konvencijam iz leta 1977 pa je Haaška konvencija postala zastarela (Senković, 2013: 11–12).

Drugi protokol

Haaška konvencija je ponovno postala aktualna v osemdesetih in devetdesetih letih 20. stoletja. V iransko-iraški vojni je prišlo do uničenja kulturnih dobrin na obeh v vojno vpletenih straneh. Med vojaškimi spopadi na ozemlju bivše Jugoslavije smo lahko praktično v živo spremljali uničenje Starega mostu čez reko Neretvo v Mostarju in bombardiranje starega dubrovniškega mestnega jedra, ki je bilo pod zaščito Unesca. Leta 1991 je

2 Člen 5 Haaške konvencije o bombardiranju s strani pomorskih sil v času vojne določa znak pravokotne oblike, ki je diagonalno razdeljen na dva trikotna dela; zgornji trikotnik je črne, spodnji pa bele barve.

3 V nadaljevanju Unesco.

4 Nekateri dogodki pričajo, da označitev kulturne dobrine pripomore k njenemu uničenju. Nedolgo zatem, ko so med obleganjem Vukovarja leta 1991 na Vukovarski muzej namestili znak konvencije, je ta postal cilj obstreljevanja pripadnikov JLA.

nizozemska vlada naročila recenzijo Haaške konvencije. Poročilo, ki ga je pripravil profesor Boylan, je pokazalo, da je Haaška konvencija še vedno veljavna in delujoča pogodba, katere težava je nezadostna izvedba. Revizija konvencije je svoj vrhunec dosegla na konferenci v Haagu leta 1999, kjer so delegati 26. marca sprejeli Drugi protokol k Haaški konvenciji o varstvu kulturnih dobrin v primeru oboroženega spopada (prav tam).
Drugi protokol Haaško konvencijo dopolnjuje in je v nobenem primeru ne nadomešča. Pomembnejše spremembe, ki jih prinaša Drugi protokol, so seznam ukrepov, ki naj jih članice sprejmejo v miru, in vzpostavitev sklada za pomoč pri izvedbi teh ukrepov, definicija vojaške nujnosti, zahteva po sorazmernosti napadov, prepoved arheoloških izkopavanj na okupiranih območjih, vzpostavitev razširjenega varstva ter definicija kazenskih sankcij zaradi kršitve konvencije. V 15. členu je opredeljenih pet kršitev, za katere se uvaja individualna kazenska odgovornost (internet 5).

Dopolnilna protokola I in II

Dopolnilna protokola I in II k Ženevskim konvencijam iz leta 1949 sta bila sprejeta leta 1977. Prvi pokriva področje mednarodnih oboroženih konfliktov, drugi pa področje notranjih oboroženih konfliktov. Oba vsebujeta tudi člene, ki se nanašajo na kulturne dobrine.
Tako kot Haaška konvencija tudi Dopolnilna protokola I in II k Ženevskim konvencijam iz leta 1949 govorita o zaščiti, le da sta v svojih definicijah zaščite kulturnih dobrin nekoliko »ožja«. Člen 53 Dopolnilnega protokola I prepoveduje storiti kakršno koli sovražno dejanje proti zgodovinskim spomenikom, umetniškim delom ali svetiščem, ki so kulturna in duhovna dediščina naroda, 16. člen Dopolnilnega protokola II pa dodatno prepoveduje uporabo omenjenih kulturnih dobrin za podporo vojaškemu delovanju (Zidar, 2019). V obeh primerih gre za zaščito kulturnih dobrin naroda, medtem ko Haaška konvencija govori o celotnem človeštvu. Kljub razlikam v definicijah lahko iz komentarja Mednarodnega odbora Rdečega križa k Dopolnilnim protokolom I in II razberemo, da je osnovna ideja vseh dokumentov enaka (Rawan, 2017: 105; O'Keefe, 2006: 209).

Nekateri primeri uničenja kulturnih dobrin med oboroženim spopadom in njihove pravne posledice

Kulturne dobrine kot zasebna lastnina uživajo splošno zaščito po mednarodnem humanitarnem pravu, med oborožen konfliktom pa so še dodatno zaščitene. Napadi na kulturne dobrine med oboroženim konfliktom veljajo za resno kršitev mednarodnega humanitarnega prava in padejo pod jurisdikcijo nekaterih mednarodnih sodišč (Gottlieb, 2020: 292). Resnost kršitev sta v svojih sodbah prepoznala tudi Mednarodno sodišče za vojne zločine na območju nekdanje Jugoslavije in Mednarodno kazensko sodišče.

Dubrovnik

Septembra 1991 so se pričele sovražnosti med JLA in hrvaškimi obrambnimi silami na južnem obalnem območju Hrvaške. Tridesetega septembra 1991 je bila vzpostavljena blokada mesta Dubrovnik. Šestega decembra 1991 ob 5.50 so pripadniki JLA, nameščeni v okolici Dubrovnika, začeli artilerijski napad na mesto. Napad je z občasnimi prekinitvami trajal več kot deset ur. Najprej je bil usmerjen na Srd, vzpetino, ki se dviga nad Dubrovnikom, na kateri so bili hrvaški obrambni položaji. Sočasno je potekal tudi napad pehotnih sil JLA na Srd, ki pa se je končal neuspešno. Sčasoma se je glavnina artilerijskega napada preusmerila iz Srda na sam Dubrovnik, vključno s starim mestnim jedrom. Med napadom sta dve osebi umrli,[5] dve pa sta bili huje ranjeni. Posledice napada so bile tudi uničene ali poškodovane kulturne dobrine, predvsem v Starem mestu. Med napadom je bilo v starem mestnem jedru popolnoma uničenih šest objektov, 46 je bilo poškodovanih, med njimi cerkve, samostani, mošeja in sinagoga, za 64 objektov pa sodišče ni moglo zagotovo potrditi, da so bili poškodovani med vojaškim napadom 6. decembra (internet 6). Ker je bilo staro mestno jedro Dubrovnika od leta 1979 vpisano na Unescov seznam svetovne dediščine, je bilo sodišče mnenja, da prav vsak uničen ali poškodovan objekt v njem zapade pod člen 3 (d) statuta Mednarodnega sodišča za vojne zločine na območju nekdanje Jugoslavije, ki pravi, da ima sodišče mandat za pregon oseb, ki so odgovorne za prilastitev, uničenje ali naklepno povzročanje škode institucijam, posvečenim religiji, dobrodelnosti in izobraževanju, umetnosti in znanosti, zgodovinskim spomenikom ter umetniškim in znanstvenim delom (prav tam).
General Pavle Strugar je bil na Mednarodnem sodišču za vojne zločine na območju nekdanje Jugoslavije obtožen in obsojen za kršitve zakonov in običajev vojne, poleg napada na civiliste tudi za prilastitev, uničenje ali naklepno povzročanje škode institucijam, posvečenim religiji, dobrodelnosti in izobraževanju, umetnosti in znanosti, zgodovinskim spomenikom ter umetniškim in znanstvenim delom (internet 7). Sodba temelji na njegovi poveljniški odgovornosti, saj je od 12. oktobra 1991 poveljeval 2. operativni skupini JLA, ki je bila septembra 1991 oblikovana za vodenje vojnih operacij na področju Dubrovnika. Generalu Strugarju namreč ni bilo dokazano, da bi izdal ukaz za napad na Dubrovnik in njegovo staro mestno jedro, je pa bilo sodišče mnenja, da bi enotam JLA, ki so bile udeležene v napadu na Srd in Dubrovnik, lahko prepovedal obstreljevanje Starega mesta oziroma bi lahko zaustavil napad potem, ko se je ta začel. Sam napad na Dubrovnik je izvedel 3. bataljon 472. motorizirane brigade JLA, ki je bil po liniji vodenja in poveljevanja podrejen generalu Strugarju (internet 6). Princip individualne odgovornosti nadrejenega, ki ni preprečil ali kaznoval zločinov, ki so jih izvršili njegovi podrejeni, je uveljavljen v običajnem pravu, ki velja tako za mednarodne kot za notranje oborožene konflikte.
Med procesom so bile zavrnjene trditve obrambe, da so pripadniki JLA le odgovarjali na napade pripadnikov hrvaških obrambnih sil, ki naj bi imeli svoje položaje znotraj starega mestnega jedra Dubrovnika in v njegovi neposredni okolici. V napadu na staro mestno jedro tako ni bilo nikakršne vojaške nujnosti, saj uničenje tamkajšnjih objektov ni pomenilo nikakršne vojaške prednosti. Vojaški strokovnjak, ki je kot priča sodeloval na procesu proti generalu Strugarju, je podal mnenje, da staro mestno jedro zaradi ozkih ulic, visokih stavb in trdih tal ni primerno za minometne položaje. Prav tako so bile zavrnjene trditve, da poveljstvo 2. operativne skupine JLA ni vedelo nič o napadu na Dubrovnik in njegovo staro mestno jedro.
Generala Strugarja je Mednarodno sodišče za vojne zločine na območju nekdanje Jugoslavije leta 2005 obsodilo na osem let zapora. Pritožbeni senat je generalu leta 2008 kazen znižal za pol leta (internet 8).

Timbuktu

V začetku leta 2012 se je na ozemlju afriške države Mali pričelo nasilje, ki je pripeljalo do tega, da so različne oborožene skupine razglasile neodvisnost severa države s prestolnico Timbuktu. Najmočnejši med temi skupinami sta bili Ansar Dine in Al Kaida islamskega Magreba, ki sta pričeli vpeljevati šeriatsko pravo. Med drugim so nove oblasti ustanovile posebno enoto, imenovano Hesbah, ki je skrbela za javno moralo. Hesbah je od ustanovitve aprila 2012 pa do septembra 2012 vodil Ahmad Al Faqi Al Mahdi (internet 9).
Konec junija 2012 je Iyad Ag Ghaly, vodja skupine Ansar Dine, sprejel odločitev o uničenju mavzolejev v Timbuktuju. Ti so skupaj z mošejami predstavljali integralni del verskega življenja prebivalcev Timbuktuja. Bili so prostor molitve in za nekatere prostor romanja. Po mnenju vodstva skupine Ansar Dine pa naj jih Alah ne bi maral (Gottlieb, 2020: 297). V akciji, ki je potekala med 30. junijem in 11. julijem 2012, je bilo uničenih devet mavzolejev ter vrata mošeje Sidi Yahia. Prebivalci Timbuktuja so verjeli, da bo odprtje vrat povzročilo konec sveta, zato so se v skupini Ansar Dine odločili, da morajo narediti konec temu neislamskemu vraževerju (Kila in Balcells, 2015: 176).
Z izjemo enega mavzoleja so bili vsi objekti na Unescovem seznamu svetovne dediščine. Nobeden izmed uničenih objektov ni bil vojaški cilj (internet 9). Al Mahdi, prvotno sicer nasprotujoč tej odločitvi, je prevzel vodstvo akcije in osebno pripravil načrt uničenja. V akciji so sodelovali njemu podrejeni pripadniki Hesbaha. Sam Al Mahdi je priskrbel potrebno orodje za izpolnitev naloge, nadzoroval izvedbo naloge ter osebno sodeloval pri uničenju najmanj štirih mavzolejev ter vrat mošeje Sidi Yahia (prav tam).
Al Mahdi je bil leta 2015 aretiran v Nigru in predan Mednarodnemu kazenskemu sodišču. Proces proti njemu se je pričel 22. avgusta 2016 (internet 10). Al Mahdi je bil prva oseba, ki se ji je sodilo za vojna hudodelstva izključno na osnovi zločinov proti kulturnim dobrinam. Obtožen je bil na podlagi člena 8(2)(w)(iv) Rimskega statuta Mednarodnega kazenskega sodišča, ki kot vojno hudodelstvo opredeljuje naklepne napade na zgradbe, namenjene veri, izobraževanju, umetnosti, znanosti ali dobrodelni dejavnosti, zgodovinske spomenike, bolnišnice in kraje, kjer se zbirajo bolniki in ranjenci, če ti objekti niso vojaški cilji (internet 9). Med sojenjem se je Al Mahdi izrekel za krivega.
Mednarodno kazensko sodišče je 27. septembra 2016 sprejelo odločitev, da je Al Mahdi kot sostorilec kriv za očitano mu vojno hudodelstvo. Ob upoštevanju nekaterih olajševalnih okoliščin je bil obsojen na devet let zapora (prav tam). Sedemnajstega avgusta 2017 ga je Mednarodno kazensko sodišče za uničenje mavzolejev in mošeje v Timbuktuju obsodilo še na plačilo 2,7 milijona evrov (internet 11).
Kmalu po izrečeni sodbi so se pojavili pomisleki glede nje. William Schabas v svojem članku zastopa mnenje, da je bil Al Mahdi obsojen za zločin, ki ga ni zagrešil. Za krivega se je izrekel na podlagi člena 8(2)(w)(iv) Rimskega statuta Mednarodnega kazenskega sodišča, ki velja za notranje oborožene konflikte. A po mnenju Schabasa (2017) v času, ko so bili uničeni mavzoleji v Timbuktuju, na tem območju ni bilo aktivnosti, ki bi jih lahko opisali kot vojaške ali bojne. Timbuktu je bil trdno v rokah upornikov, ki so območje vodili preko lokalnih odborov. Oboroženi nasprotniki so bili od Timbuktuja oddaljeni več sto kilometrov.
Schabasa (prav tam) je zmotila tudi beseda »napad« (angl. *attack*), ki je navedena v omenjenem členu Rimskega statuta. Po njegovem mnenju ta beseda ne opisuje uničenja verskih objektov s krampi in podobnim orodjem v času, ko v bližini ni oboroženih nasprotnikov. Schabasu pritrjuje Dopolnilni protokol I k Ženevskim konvencijam, ki v 1. alineji 49. člena napade opredeljuje kot nasilna dejanja proti nasprotniku, storjena v napadu ali obrambi (Zidar, 2019). Tudi Drugi protokol k Haaški konvenciji o varstvu kulturnih dobrin v primeru oboroženega spopada razlikuje med napadom na kulturne dobrine in njihovim uničenjem. Namen Schabasovega pisanja seveda ni, da bi dokazal, kako dejanje Al Mahdija ni vsega zaničevanja vredno, ampak le predstavitev mnenja, da bi mu bilo treba soditi na drugih

5 Tonči Skočko in Pavo Urban.

pravnih osnovah.

Zaključek

Kulturna dediščina je bila v vsej zgodovini vojskovanja deležna uničenj ali poškodovanj. Uničena je bila bodisi zaradi direktnega napada nanjo, bodisi kot posredna škoda, bodisi zaradi zanemarjanja ali plenjenja. V 16. stoletju so se pojavili prvi premisleki, da je spomenike in umetniška dela med vojno treba zaščiti. Do danes je pravna zaščita kulturnih dobrin za čas oboroženih konfliktov precej napredovala, a dogodki v 21. stoletju nam kažejo, da na tem področju očitno še ni bilo storjeno dovolj.

Danes večina oboroženih konfliktov ne poteka na klasičen način. Na bojnem polju si v mnogih primerih nasproti ne stojita več armadi dveh sovražnih si držav, temveč so v konflikt udeležene različne oborožene skupine, med katerimi so mnoge označene za teroristične. Kot lahko vidimo tudi v primeru Timbuktuja, se te skupine ne držijo splošno sprejetih pravil o zaščiti kulturne dediščine. Problem je tudi dejstvo, da se mnoge izmed teh skupin financirajo z nelegalno prodajo predmetov kulturne dediščine, kar je tudi tema za samostojen prispevek.

Kako naprej?

Na to vprašanje ni lahkega odgovora. Še naprej si bo treba prizadevati za ozaveščanje prebivalstva, da kulturna dediščina nekega naroda predstavlja dediščino celotnega človeštva. Dejstvo je, da ko je kulturna dediščina enkrat uničena, je uničena za vedno. Mednarodna in druga sodišča bi se lahko še bolj posvetila uničenju kulturne dediščine. Ostrejša kaznovalna politika na tem področju bi morda delovala odvračilno. Več napora pa bi bilo treba vložiti tudi v ukrepe za zaščito kulturne dediščine, ki bi jih posamezne države lahko izvajale ali bi jih morale izvajati v mirnem času.

Viri in literatura

Gottlieb, Y. (2020): Attacks Against Cultural Heritage as a Crime Against Humanity. *Case Western Reserve Journal of International Law*, 52(1), str. 287–330.

Grotius, H. (2005): *The Rights of War and Peace*. Indianapolis, Liberty Fund.

Kane, L. J. (2011): *Rebuilding to Remember, Rebuilding to Forget: The Tangible and Intangible Afterlife of Architectural Heritage Destroyed by Acts of War.* Magistrska naloga. The State University of New Jersey, Graduate School-New Brunswick Rutgers. https://rucore.libraries.rutgers.edu/rutgers-lib/33773/ (dostop 5. 1. 2022).

Keane, D. (2004): The Failure to Protect Cultural Property in Wartime. *DePaul Journal of Art, Technology & Intellectual Property Law*, 14(1), str. 1–38.

Kila, J. D., in Marc Balcells, M. (ur.) (2015*): Cultural Property Crime, An Overview and Analysis of Contemporary Perspectives and Trends*. Leiden, Brill.

Kuznicki, K. (2013): The Authenticity of the Reconstructed Old Town of Warsaw: a Reflection. http://www.e-conservation.org/issue-1/16-the-authenticity-of-the-reconstructed-old-town-of-warsaw (dostop 4. 1. 2022).

O'Keefe, R. (2006): *The Protection of Cultural Property in Armed Conflict*. Cambridge, Cambridge University Press.

Omilanowska, M. (2016): Architectural Reconstructions in post-war Poland. Architectura - Zeitschrift für Geschichte der Baukunst, 46(1), str. 29–48.

Schabas, W. (2017): Al Mahdi Has Been Convicted of a Crime He Did Not Commit. *Case Western Reserve Journal of International Law*, 49(1), str. 75–102.

Senković, S. (2013): *Mednarodna zaščita kulturnih dobrin v času oboroženih spopadov*. Diplomska naloga. Univerza v Ljubljani, Pravna fakulteta, Katedra za mednarodno pravo.

Sveto pismo Stare in Nove zaveze (2016). Ljubljana, Svetopisemska družba Slovenije.

Turku, H. (2018): *The Destruction of Cultural Property as a Weapon of War, ISIS in Syria and Iraq*. London, Palgrave Macmillan.

Rawan, Z. (2017): Great, Greatest or Outstanding: Defining Cultural Property in NATO Operational context. *Nato Legal Gazette*, 38, str. 100–114.

Zakon o varstvu kulturne dediščine. Uradni list RS, št. 16/08. Ljubljana.

Zidar, A. (gl. ur.) (2019): Ženevske konvencije in Dopolnilni protokoli, II. del – Protokoli. Ljubljana, Založba FDV in MZZ RS.

Internet 1: Instructions for the Government of Armies of the United states in the Field (Lieberjev kodeks). https://ihl-databases.icrc.org/applic/ihl/ihl.nsf/ART/110-20035?OpenDocument (dostop 24. 2. 2021)1.

Internet 2: Haaški pravilnik o zakonih in običajih vojne na kopnem. https://www.loc.gov/law/help/us-treaties/bevans/m-ust000001-0631.pdf (dostop 24. 2. 2021).

Internet 3: Roerichov pakt. https://www.researchgate.net/publication/331807988_The_Roerich_Pact_Three_Documents/link/5c8d29a9a6fdcc38175ed0b/download (dostop 3. 3. 2021).

Internet 4: Konvencija o varstvu kulturnih dobrin v primeru oboroženega spopada. https://www.zvkds.si/sites/www.zvkds.si/files/uploads/files/publication/konvencija_o_vasrtvu_kdvpos.pdf (dostop 9. 3. 2021).

Internet 5: Drugi protokol k Haaški konvenciji o varstvu kulturnih dobrin v primeru oboroženega spopada. https://ihl-databases.icrc.org/applic/ihl/ihl.nsf/ART/590-15?OpenDocument (dostop 7. 4. 2021).

Internet 6: Sodba Mednarodnega sodišča za vojne zločine na območju nekdanje Jugoslavije št. IT-01-42-T z dne 31. 1. 2005, zadeva Strugar. https://www.icty.org/x/cases/strugar/tjug/en/str-tj050131e.pdf (dostop 9. 3. 2021).

Internet 7: Obtožnica Mednarodnega sodišča za vojne zločine na območju nekdanje Jugoslavije št. IT-01-42-PT z dne 10. 12. 2003, zadeva Strugar. https://www.icty.org/x/cases/strugar/ind/en/str-3ai031210e.pdf (dostop 9. 3. 2021).

Internet 8: https://www.dnevnik.si/334345 (dostop 17. 3. 2021).

Internet 9: Sodba Mednarodnega kazenskega sodišča št. ICC-01/12-01/15 z dne 27. 9. 2016, zadeva Al Mahdi. https://www.icc-cpi.int/CourtRecords/CR2016_07244.PDF (dostop 2. 4. 2021).

Internet 10: https://en.wikipedia.org/wiki/Ahmad_al-Faqi_al-Mahdi (dostop 2. 4. 2021).

Internet 11: https://www.rtvslo.si/svet/malijski-skrajnez-mora-za-unicevanje-unescove-dediscine-timbuktuja-placati-2-7-milijona-evrov/430270 (dostop 2. 4. 2021).

Rok Filipčič

Protection of cultural heritage in times of armed conflict

Professional article
COBISS 1.04

UDC
719:316.485.26

Keywords: cultural heritage, armed conflict, destruction, legal protection, judicial practice

Abstract

The paper presents the importance of protecting cultural heritage in the event of armed conflict. Cultural heritage has been subject to damage or destruction during armed conflicts throughout practically the entire history of warfare. If looting is added to this, the (negative) picture of attitudes towards cultural heritage becomes even clearer. The idea that monuments and works of art needed protection in times of war made its first appearance in the sixteenth century. Enlightenment thinkers and their successors were behind the development of legal protection for cultural heritage during armed conflicts as we know it today. The author presents the history of the protection of cultural heritage and two criminal cases before international courts in which individuals were found guilty of the destruction of cultural heritage.

Experience shows that culture and cultural heritage play an important role in modern conflicts. The destruction of the Stari Most (Old Bridge) spanning the Neretva in Mostar, the artillery bombardment of Dubrovnik's Old Town, the destruction of ancient Palmyra and that of the famous Buddhas of Bamiyan: all events that we were able to follow practically live. The destruction of heritage can break connections with the past and, consequently, erase identity from historical memory.

Introduction

Cultural heritage means property inherited from the past which individuals define as a reflection and expression of their values, identities, religious and other beliefs, knowledge and traditions. It includes aspects of the environment that derive from the interaction of people and place over time.[1]

1 Taken from the definition of heritage given in the second paragraph of the first article of the Cultural Heritage Protection Act (ZVKD-1), adopted on 1 February 2008. The Convention for the Protection of Cultural Property in the Event of Armed Conflict (the 1954 Hague Convention) uses the term "cultural property". For the purposes of the Convention, the term "cultural property" covers:

a) movable or immovable property of great importance to the cultural heritage of every people, such as monuments of architecture, art or history, whether religious or secular; archaeological sites; groups of buildings which, as a whole, are of historical or artistic interest; works of art; manuscripts, books and other objects of artistic, historical or archaeological interest; as well as scientific collections and important collections of books or archives or of reproductions of the property defined above;

b) buildings whose main and effective purpose is to preserve or exhibit the movable cultural property defined in sub-paragraph (a) such as museums, large libraries and depositories of archives, and refuges intended to shelter, in the event of armed conflict, the movable cultural property defined in sub-paragraph (a);

c) centres containing a large amount of cultural property as defined in sub-paragraphs (a) and (b), to be known as "centres containing monuments".

Rok Filipčič, senior curator, Slovenian Armed Forces Museum, Maribor, rok.filipcic@mors.si

Yet the destruction and looting of cultural property during armed conflicts are not modern inventions. These actions are as old as war itself. One of the earliest mentions of the attitude of ancient civilisations towards cultural property can be found in the Old Testament. The chapter on the Principles of Warfare in the Book of Deuteronomy includes the following verse: "But the women, the little ones, the livestock, and all that is in the city, all its spoil, you shall plunder for yourself; and you shall eat the enemies' plunder which the Lord your God gives you." (Deuteronomy 20:14, New King James Version). After crushing the Babylonian revolts, the Persian king Xerxes I began systematically destroying the symbols of Babylonian identity. Among other things he destroyed the Esagila, a temple dedicated to Marduk, the protector god of Babylon. Herodotus also attributes Xerxes I with the sacking and destruction of the Acropolis of Athens, and of Athens itself (Turku, 2018: 31–32). During the First Jewish–Roman War (AD 66–73), Roman units commanded by the future emperor Titus destroyed a large part of Jerusalem and demolished the Temple. When Titus died, the Arch of Titus was built in Rome in his memory. A panel of decorative sculpture on the arch depicts soldiers carrying off plunder from the Temple of Jerusalem. The spoils of this war paid for the building of the Roman Colosseum (ibid.: 33). The period of Napoleon's conquests saw the systematic plunder of works of art from conquered countries. In more recent times, too, our ancestors witnessed the destruction of cultural heritage. The First World War saw the destruction of Reims Cathedral and the university library in Leuven and the repeated bombardment of Venice. The Benedictine abbey of Monte Cassino, destroyed during the Second World War, is a symbolic example of the destruction of cultural property during armed conflict.

Attempts to protect cultural heritage

For centuries it was considered that, provided a war was justified, all means to achieve its ends were permitted. All property of the enemy could be destroyed if this contributed to military victory. This also included the destruction of civilian property. The sixteenth century saw the rise of the idea that monuments and works of art represented a special category of property that needed protecting during wars. Some Enlightenment jurists were of the opinion that the destruction of cultural properties was almost never justified by military objectives. Hugo Grotius quoted the ancient Greek historian Polybius, who believed that it was madness to destroy things such as monuments, porticos and similar works of artistic value whose destruction neither impairs an enemy's strength nor increases that of the destroyer (Grotius, 2005: 1446). Perhaps the most forthright was Emer de Vattel, who wrote in his famous work *Le Droit des gens, ou Principes de la loi naturelle* (The Law of Nations: Or, Principles of the Law of Nature): "For whatever reason a belligerent ravages a country, those edifices which do honour to human society and do not contribute to an increase in the enemy's strength should be spared: temples, tombs, public buildings, and all other works of remarkable beauty. What can be gained from their destruction? Only an enemy of mankind would deprive it happily of these monuments of art and models of taste" (O'Keefe, 2006: 11). No special consideration had yet been given to the question of the seizure of the enemy's property – to which, under international law in force at the time, the victor had every right.

The French Revolution and the Napoleonic Wars marked a turning point in attitudes to the legal protection of monuments and works of art. The passions inflamed by the Revolution posed a grave threat to the artworks and monuments of France. A special Commission on Monuments was established in 1790 to assume stewardship over the confiscated cultural property of the nobility, the Church and émigrés, which was now the heritage (*patrimoine*) of all (ibid.: 13–14). Even the decrees issued somewhat later ordering the destruction of the vestiges of pre-revolutionary despotism made an exception for valuable works of art. Outside France, however, Napoleon's military conquests were accompanied by the systematic appropriation, by plunder and coerced treaty, of artworks from France's defeated enemies, which went to fill the Museé Central des Arts (Senković, 2013: 4). The inspiration for this was a vision of pan-European artistic culture, of which France, as a republic among tyrannies, was best placed to act as custodian. But the same vision inspired the policy's critics. The fine arts scholar Antoine Quatremère de Quincy published a set of open letters condemning the removal of treasures of art from Italy. In his view, the arts and sciences belonged to all of Europe and were no longer the exclusive property of one nation (O'Keefe, 2006: 15). After Napoleon's defeat, France was ordered to return the plundered works.

Legal protection of cultural heritage

Meanwhile, on the other side of the Atlantic, the emerging principle that works of art were part of the common heritage of mankind and, as such, enjoyed a special status was given further affirmation by a British Court of Vice-Admiralty in Halifax, Nova Scotia, which decreed the return of artworks seized by a British ship during the Anglo-American War of 1812 (ibid.).

The Lieber Code

The Lieber Code, signed by President Abraham Lincoln and issued as General Orders No. 100 during the American Civil War, was the first codification of the laws of war. It also contained the first rules dedicated to the protection of cultural property. Article 35 of the Code provides that "classical works of art, libraries, scientific collections, or precious instruments, such as astronomical telescopes, as well as hospitals, must be secured against all avoidable injury, even when they are contained in fortified places whilst besieged or bombarded" (internet 1). The Lieber Code influenced the Brussels Declaration concerning the Laws and Customs of War (1874) and the Oxford Manual of the Laws and Customs of War (1880), both of which prohibited the destruction of the enemy's property if not required by military necessity.

The Hague Conventions of 1899 and 1907

The first formal international treaties providing for the protection of cultural property during wartime were the second and fourth Hague Conventions and their annexed Regulations concerning the Law and Customs of Wars on Land, issued in 1899 and 1907 (Keane, 2004: 4).
Article 27 of the 1907 Regulations provides that "In sieges and bombardments all necessary steps must be taken to spare, as far as possible, buildings dedicated to religion, art, science, or charitable purposes, historic monuments, hospitals, and places where the sick and wounded are collected, provided they are not being used at the time for military purposes." The same Article goes on to state that "It is the duty of the besieged to indicate the presence of such buildings or places by distinctive and visible signs, which shall be notified to the enemy beforehand" (internet 2). The Regulations do not say what this sign should look like, although it is described in the Convention concerning Bombardment by Naval Forces in Time of War (1907).[2] Also worth mentioning is Article 23 of the 1907 Regulations, which allows the destruction or seizure of the enemy's property if such destruction or seizure be imperatively demanded by the necessities of war (internet 2). The Hague Regulations thus only explicitly prohibit the bombardment of the buildings and historic monuments listed, while all other forms of attack are permitted. The Regulations also cover the protection of cultural property during military occupation. Article 56 states that the property of institutions dedicated to religion, charity and education, the arts and sciences, even when State property, shall be treated as private property. All seizure of, destruction or wilful damage done to institutions of this character, historic monuments, works of art and science, is forbidden, and should be made the subject of legal proceedings (ibid.).
The provisions of the Hague Regulations concerning the Law and Customs of Wars on Land have become rules of customary law and still apply as such. The Regulations established three principles with regard to the protection of cultural property. Cultural monuments and buildings dedicated to the sciences and arts, which must be indicated by visible signs, are protected against military attack except in cases where they are used for military purposes. Such protection is subordinate to military necessity. In the case of occupation, cultural property must be treated as private property; the occupying forces must not damage, destroy or seize it (Senković, 2013: 7).

The World Wars

The First World War exposed the inadequacy of the rule on bombardment embodied in Article 25 of the Hague Regulations concerning the Law and Customs of Wars on Land, which prohibits the attack or bombardment, by whatever means, of towns, villages, dwellings, or buildings which are undefended (internet 2). As a result of technological advances in various types of weaponry, practically every town behind the lines was within range of the enemy's artillery or air force. Moreover, the scale of mobilisation meant that these towns were full of troops, making them in a sense defended. Consequently all private property, except for cultural property covered by Article 27 of the Hague Regulations concerning the Law and Customs of Wars on Land, was legally open to attack. Unfortunately, advances in the science of explosives were not accompanied by improvements in the precision with which they could be targeted. Accordingly, all cultural property situated in a defended town could become the indirect object of attack. In March 1918, for example, a German shell destroyed the nave of the thirteenth-century church of St Gervais in Paris (O'Keefe, 2006: 37).
As has already been mentioned, the First World War showed that the rules on bombardment were too lax. The Commission of Jurists appointed in 1922 by the Washington Conference on the Limitation of Armaments drafted the Rules of Air Warfare, which were adopted a year later (Senković, 2013: 8). In these draft Rules, the distinction between defended and undefended towns was replaced by a distinction between military facilities and the civilian population. Article 24 states that an air bombardment is legitimate only when it is directed against a military objective. Article 25 requires military commanders to take all necessary steps to spare, as far as possible, buildings dedicated to public worship, art, science .... and historic monuments (O'Keefe, 2006: 45). The Rules were never adopted in legally binding form, since they were overtaken by the outbreak of the Second World War, but they did represent a basis for the further protection of cultural property.

2 Article 5 of the Hague Convention concerning Bombardment by Naval Forces in Time Of War specifies a sign consisting of a large, stiff rectangular panel divided diagonally into two coloured triangular portions, the upper portion black, the lower portion white.

The Roerich Pact

Further progress in this field was represented by the Roerich Pact, which envisages the neutrality of historic buildings and monuments. This neutrality shall only cease in the event that these buildings or monuments are used for military purposes. The Pact also introduced a distinctive sign – "a red circle with a triple red sphere in the circle on a white background" – for the identification of the protected objects (internet 3). The Roerich Pact was signed by "the twenty-one American Republics" and later ratified by ten States Parties. The Pact, which remains valid in relations between the States Parties, significantly influenced the drafting of the 1954 Hague Convention.
The outbreak of the Second World War marked the start of an extremely unfavourable period for the development of the protection of cultural property. Military necessity, which still took priority over the protection of cultural property, resulted in the destruction of numerous urban centres and individual historic monuments of enormous value for the whole of mankind. The best-known example, perhaps even a symbol of the destruction of cultural heritage, is the Allied bombing of the Benedictine abbey of Monte Cassino, south-east of Rome. A German defensive line ran close to the abbey, although German forces did not occupy the abbey itself. Acting on intelligence that the abbey was being used by the Wehrmacht, Allied commander Lt Gen Bernard Freyberg requested an air raid. The ruins of the abbey were subsequently occupied by German units, who transformed it into a fortress which the Allies failed to capture until after the German withdrawal. The historic Old Town of the Polish capital Warsaw represents an example of the wartime destruction and later rebuilding of an urban centre. The destruction of Warsaw was on such a scale that it may be compared to the sacking of Carthage during the Third Punic War (Kuznicki, 2013). Plans for the destruction of Warsaw and its transformation into a German city were drawn up even before the start of the Second World War. The Warsaw Uprising that began in August 1944 spurred the Germans to put into effect their plan to destroy the city once and for all. In November 1944 the 100,000 remaining inhabitants of the city were expelled and "special destruction detachments" were formed. A list was made of the most significant Polish national monuments, which were to be destroyed first (ibid.). This was followed by the destruction of other public and private buildings. Each building was first set on fire, after which its remains were blown up with explosives. Warsaw was liberated in January 1945. It is estimated that approximately 85% of the Old Town was destroyed (Kane, 2011: 16). The decision to reconstruct Warsaw's Old Town was taken shortly after the liberation of the city. In this way, the Poles also reconstructed their cultural identity (Omilanowska, 2016: 32). The rebuilding of the shattered city was more or less complete by the late 1950s, although individual works continued in the decades that followed.
The danger of destruction during military conflict was not, however, the only threat facing cultural property. German troops transported countless works of arts to Germany from the areas under their occupation. After the end of the war, Allied troops discovered several hundred warehouses full of artworks. Alfred Rosenberg, the leader of the *Einsatzstab Reichsleiter Rosenberg*, a task force created to appropriate cultural property for Germany, was sentenced to death for war crimes and crimes against humanity by the International Military Tribunal in Nuremberg and executed on 16 October 1946 (Keane, 2004: 12). The trials of Rosenberg and other Nazi leaders convicted of plundering cultural property are considered the first true international enforcement of protection of cultural property (Gottlieb, 2020: 293).

The 1954 Hague Convention

In 1949 the United Nations Educational, Scientific and Cultural Organisation[3] commenced preparations for a new agreement on the protection of cultural property in the event of armed conflict. A year later the Director General set up a working group to draft a new convention. From 21 April to 14 May 1954, an international conference was held in The Hague with the participation of delegations from 56 states. The Convention for the Protection of Cultural Property in the Event of Armed Conflict with Regulations for the Execution of the Convention was adopted on 14 May 1954, along with the Protocol to the Hague Convention, today known as the First Protocol. Both documents entered into force on 7 August 1956 (O'Keefe, 2006: 93–94). The preamble to the Hague Convention states that "... damage to cultural property belonging to any people whatsoever means damage to the cultural heritage of all mankind, since each people makes its contribution to the culture of the world" (internet 4). The Hague Convention is the first international treaty to deal exclusively with the protection of cultural property in the event of armed conflict. It is divided into eight sections. Chapter I covers general provisions regarding protection, Chapter II deals with special protection, Chapter III covers the transport of cultural property, Chapter IV covers personnel, Chapter V covers the distinctive emblem, Chapter VI defines the scope of application of the Convention and Chapter VII details the execution of the Convention. The eighth and last section contains the final provisions. The most important article of the Hague Convention is Article 4, in which the High Contracting Parties undertake to respect cultural property situated within their own territory as well

3 Hereinafter referred to as UNESCO.

as within the territory of other High Contracting Parties (ibid.). Article 16 of the Hague Convention defines the emblem of the Convention, which "shall take the form of a shield, pointed below, persaltire blue and white (a shield consisting of a royal-blue square, one of the angles of which forms the point of the shield, and of a royal-blue triangle above the square, the space on either side being taken up by a white triangle). (ibid.).[4]

The Hague Convention did not meet the great expectations generated at its adoption. There are several reasons for this. The protection it provided for cultural property only represented a small advance compared to the limitation of warfare that was in force before it was adopted. The special protection regime proved to be useless. The same applied to the system of international control, which was overambitious and therefore unworkable. With the adoption of the Additional Protocols to the Geneva Convention in 1977, the Hague Convention became obsolete (Senković, 2013: 11–12).

The Second Protocol

The Hague Convention became relevant again in the 1980s and 1990s. The Iran–Iraq War saw the destruction of cultural property by both sides. During the conflicts in the former Yugoslavia, we witnessed the destruction of the Stari Most (Old Bridge) over the Neretva in Mostar and the artillery bombardment of Dubrovnik's Old Town, which was under UNESCO protection, practically as they happened. In 1991 the Netherlands government commissioned a review of the Hague Convention. The resulting report, prepared by Professor Patrick Boylan, a UNESCO consultant, showed that the Hague Convention was still a valid and functioning treaty whose problem was its inadequate implementation. The review of the Convention culminated in a diplomatic conference held in The Hague in 1999. The delegates to this conference adopted the Second Protocol to the Hague Convention of 1954 for the Protection of Cultural Property in the Event of Armed Conflict on 26 March 1999 (ibid.).

The Second Protocol complements the Hague Convention and in no sense replaces it. The major changes introduced by the Second Protocol include a list of measures to be taken in peacetime and the establishment of a fund to provide assistance in the implementation of these measures, the definition of military necessity, the principle of proportionality of attacks, the prohibition of archaeological excavations in occupied areas, the establishment of enhanced protection and the definition of penalties for violations of the Convention. Article 15 defines five serious violations for which individual criminal liability is introduced (internet 5).

Additional Protocols I and II

Additional Protocols I and II to the 1949 Geneva Conventions were adopted in 1977. The first covers international armed conflicts, while the second covers non-international armed conflicts. Both also contain articles relating to cultural property.

Like the Hague Convention, Additional Protocols I and II to the 1949 Geneva Conventions talk about protection, only that their definitions of the protection of cultural property are slightly "narrower." Article 53 of Additional Protocol I prohibits any acts of hostility directed against the historic monuments, works of art or places of worship which constitute the cultural or spiritual heritage of peoples, while Article 16 of Additional Protocol II additionally prohibits the use of such cultural property in support of the military effort (Zidar, 2019). Both Additional Protocols refer to the protection of the "cultural or spiritual heritage of peoples", while the Hague Convention talks about "the whole of mankind". Despite the differences in definitions, it is evident from the comments of the International Committee of the Red Cross on Additional Protocols I and II that the essential idea of all the documents is the same (Rawan, 2017: 105; O'Keefe, 2006: 209).

Some examples of the destruction of cultural property during armed conflict and their legal consequences

While cultural property as private property enjoys general protection under international humanitarian law, it enjoys additional protection during armed conflict. Attacks against cultural heritage in the context of an armed conflict are considered a serious violation of international humanitarian law and fall within the jurisdiction of some international tribunals (Gottlieb, 2020: 292). The seriousness of such violations has also been recognised in judgements of the International Criminal Tribunal for the Former Yugoslavia and the International Criminal Court.

Dubrovnik

Hostilities between the Yugoslav People's Army (JNA) and Croatian defence forces in Croatia's southern coastal region commenced in September 1991. The blockade of the city of Dubrovnik began on 30 September 1991. At around 0550 hours on the morning of 6 December 1991, JNA units positioned around Dubrovnik began shelling the city. The artillery attack continued for more than ten hours, with occasional brief lulls. To begin with, the attack was directed at Mount Srd, a hill rising up behind Dubrovnik on which Croatian defensive positions were situated. A simultaneous attack on Srd by JNA infantry units was unsuccessful. As time went on, the main focus of the artillery attack shifted from Srd to Dubrovnik itself, including the Old Town. Two people[5] died during the attack and two others were seriously wounded. Other consequences of the attack were the destruction of or damage to cultural property, above all in the Old Town. Six buildings in the Old Town were completely destroyed in the attack, while 46 were damaged, including churches, monasteries, a mosque and a synagogue. With regard to a further 64 buildings and structures, the Tribunal could not be satisfied to the required standard that they were damaged during the attack of 6 December (internet 6). Since Dubrovnik's Old Town had been inscribed on UNESCO's World Heritage List since 1979, the Tribunal was of the opinion that every building and structure in it falls under Article 3(d) of the Statute of the Tribunal, which states, *inter alia*, that the Tribunal shall have the power to prosecute persons violating the laws or customs of war, including the seizure of, destruction or wilful damage done to institutions dedicated to religion, charity and education, the arts and sciences, historic monuments and works of art and science (ibid.).

General Pavle Strugar was charged at the International Criminal Tribunal for the Former Yugoslavia with violations of the laws and customs of war, with counts including attacks on civilians and destruction or wilful damage done to institutions dedicated to religion, charity and education, the arts and sciences, historic monuments and works of art and science (internet 7). The judgement is based on his responsibility as commander, in that on 12 October 1991 he was named commander of the 2nd Operations Group of the JNA, which was formed in September 1991 to conduct the military campaign in the Dubrovnik region. It was not proved that General Strugar gave the order to attack Dubrovnik and its Old Town. The Tribunal was, however, of the opinion that General Strugar was in a position where he could have prohibited the JNA units involved in the attack on Mount Srd and Dubrovnik from shelling the Old Town or could have halted the attack after it had begun. The attack on Dubrovnik was actually carried out by the 3rd Battalion of the 472nd Motorised Brigade of the JNA, which was subordinated to General Strugar in terms of the line of command and control (internet 6). The principle of the individual responsibility of a superior who fails to prevent or punish crimes committed by his subordinates is a well-established principle of customary law that applies to both international and non-international armed conflicts.

The claims of the defence that the members of the JNA were merely responding to attacks by members of the Croatian armed forces, who had taken up positions within Dubrovnik's Old Town and in its immediate surroundings, were rejected by the Tribunal. There was thus no military necessity in the attack on the Old Town, since the destruction of buildings and structures there did not represent any military advantage. A military expert who appeared as a witness at General Strugar's trial gave the opinion that owing to its narrow streets, tall buildings and solid pavements, the Old Town did not represent a suitable location for mortar positions. Claims that the 2nd Operations Group Command did not know anything about the attack on Dubrovnik and its Old Town were also rejected by the Tribunal.

In 2005 the International Criminal Tribunal for the Former Yugoslavia found General Strugar guilty and sentenced him to eight years' imprisonment. In 2008 the Appeals Chamber reduced his sentence to seven and a half years' imprisonment (internet 8).

Timbuktu

Following an outbreak of violence in the West African republic of Mali in 2012, various armed groups proclaimed the independence of the north of the country, including the capital Timbuktu. The strongest of these groups were Ansar Dine and Al-Qaeda in the Islamic Maghreb, which began imposing sharia law. Among other things, the new authorities set up a special unit known as the Hesbah, tasked with upholding public morals. From its founding in April 2012 until September 2012, the Hesbah was led by Ahmad al-Faqi al-Mahdi (internet 9).

In late June 2012, the leader of the Ansar Dine group, Iyad Ag Ghaly, made the decision to destroy the mausoleums in Timbuktu. Together with the city's mosques, these were an integral part of the religious life of the inhabitants of Timbuktu. They were a place of prayer and, for some, a place of pilgrimage. Yet in the opinion of the leaders of Ansar Dine, they were not pleasing to Allah (Gottlieb, 2020: 297). In the course of a campaign that ran from 30 June until 11 July 2012, nine mausoleums and the door of the Sidi Yahia Mosque were destroyed. The people of Timbuktu believed that opening the mosque's door would bring about the end of the world. The Ansar Dine group decided to put an end to this un-Islamic superstition (Kila and Balcells, 2015: 176). With the exception of one mausoleum, all the structures had the status of protected UNESCO World Heritage sites. None of the destroyed structures represented a military objective (internet 9). Although initially opposing the decision, al-Mahdi assumed the leadership of the campaign and personally prepared the plan of destruction. His subordinates in the Hesbah took part in the campaign with him. Al-Mahdi himself provided the tools needed for

4 Some events show that the marking of cultural property can contribute to its destruction. Shortly after the sign prescribed by the Convention was placed on Vukovar Museum during the siege of Vukovar in 1991, the building became the target of shelling by the JNA.

5 Tonči Skočko and Pavo Urban.

the task, supervised its implementation and personally participated in the destruction of at least four mausoleums and the door of the Sidi Yahia Mosque (ibid.).
Al-Mahdi was arrested in Niger in 2015 and handed over to the International Criminal Court. His trial began on 22 August 2016 (internet 10). Al-Mahdi was the first person to be prosecuted by the International Criminal Court solely on the base of crimes against cultural property. He was charged under Article 8(2)(e)(iv) of the Rome Statute of the International Criminal Court, which defines as a war crime "intentionally directing attacks against buildings dedicated to religion, education, art, science or charitable purposes, historic monuments, hospitals and places where the sick and wounded are collected, provided they are not military objectives" (internet 9). Al-Mahdi entered a guilty plea at the trial.
On 27 September 2016, the International Criminal Court found al-Mahdi guilty, as a co-perpetrator, of the war crime of which he was accused. Taking into account certain mitigating circumstances, he was sentenced to nine years' imprisonment (ibid.). On 17 August 2017, the International Criminal Court further sentenced al-Mahdi to the payment of 2.7 million euros as reparations for the destruction of the mausoleums and mosque in Timbuktu (internet 11).
Not long after the verdict was announced in the al-Mahdi case, doubts began to be raised about the conviction. Canadian academic William Schabas published an article expressing his opinion that al-Mahdi had been convicted of a crime he did not commit. Al-Mahdi pleaded guilty to Article 8(2)(e)(iv) of the Rome Statute, which applies to non-international armed conflict. Schabas (2017) makes the point that, based on the record before the Court, it does not seem there was any activity that could be called "military" or "combat" in Timbuktu at the time mausoleums were destroyed. Timbuktu was securely in the hands of the rebels, who controlled the area via local committees. The nearest armed adversaries were several hundred kilometres away from Timbuktu.
Schabas (ibid.) was also troubled by the use of the word "attack", a term that is used in Article 8 of the Rome Statute. In his opinion, the term "attack" is not the word that would be used to describe the destruction of religious structures using pickaxes and similar tools at a time when there are no armed adversaries in the vicinity. Schabas's point is confirmed by Additional Protocol I to the Geneva Conventions of 1949, Article 49(1) of which defines attacks as acts of violence against the adversary, whether in offence or in defence (Zidar, 2019). The Second Protocol to the Hague Convention of 1954 for the Protection of Cultural Property in the Event of Armed Conflict likewise differentiates between attacks on cultural property and their destruction.
The purpose of Schabas's article is not, of course, to prove that al-Mahdi's conduct is not deserving of condemnation. Rather, it is the presentation of the opinion that he should have been tried on a different legal basis.

Conclusion

Cultural heritage has been subject to destruction or damage throughout the entire history of warfare. It has been destroyed either by direct attack against it or as collateral damage, whether because of neglect or as a result of plunder. The idea that monuments and works of art needed protection in times of war made its first appearance in the sixteenth century. Considerable advances in the legal protection of cultural property during armed conflicts have been made since then, but events in the twenty-first century show us that we have clearly not yet done enough in this field.
The majority of armed conflicts today take place in a non-traditional manner. In many conflicts it is no longer a case of the armies of two hostile countries facing each other on the battlefield. Conflicts can involve a variety of armed groups, many of which may be designated as terrorist groups. As we can see in the case of Timbuktu, these groups do not abide by the generally accepted rules governing the protection of cultural heritage. A further problem is represented by the fact that many of these groups are funded through the illegal sale of pieces of cultural heritage, which, however, is the subject of a separate article.
Where do we go from here?
There is no easy answer to this question. There is an ongoing need to raise public awareness of the fact that the cultural heritage of a nation or people represents the heritage of the whole of humanity. It is a fact that when cultural heritage is destroyed, it is destroyed forever. International tribunals and other courts could dedicate more attention to the destruction of cultural heritage. Harsher penalties in this field could perhaps have a deterrent effect. More effort also needs to be devoted to the measures to protect cultural heritage that individual countries could or should implement in peacetime.

References

Gottlieb, Y. (2020): Attacks Against Cultural Heritage as a Crime Against Humanity. *Case Western Reserve Journal of International Law*, 52(1), pp. 287–330.

Grotius, H. (2005): *The Rights of War and Peace.* Indianapolis: Liberty Fund.

Kane, L. J. (2011): *Rebuilding to Remember, Rebuilding to Forget: The Tangible and Intangible Afterlife of Architectural Heritage Destroyed by Acts of War.* Master's thesis. The State University of New Jersey, Graduate School–New Brunswick Rutgers. https://rucore.libraries.rutgers.edu/rutgers-lib/33773/ (accessed 5 January 2022).

Keane, D. (2004): The Failure to Protect Cultural Property in Wartime. *DePaul Journal of Art, Technology & Intellectual Property Law*, 14(1), pp. 1–38.

Kila, J. D. and Balcells, M. (eds) (2015*): Cultural Property Crime, An Overview and Analysis of Contemporary Perspectives and Trends.* Leiden: Brill.

Kuznicki, K. (2013): The Authenticity of the Reconstructed Old Town of Warsaw: a Reflection. http://www.e-conservation.org/issue-1/16-the-authenticity-of-the-reconstructed-old-town-of-warsaw (accessed 4 January 2022)
O'Keefe, R. (2006): *The Protection of Cultural Property in Armed Conflict.* Cambridge: Cambridge University Press.

Omilanowska, M. (2016): Architectural Reconstructions in post-war Poland. Architectura – Zeitschrift für Geschichte der Baukunst, 46(1), pp. 29–48.

Schabas, W. (2017): Al Mahdi Has Been Convicted of a Crime He Did Not Commit. *Case Western Reserve Journal of International Law*, 49(1), pp. 75–102.

Senković, S. (2013): *Mednarodna zaščita kulturnih dobrin v času oboroženih spopadov*. Bachelor's thesis. University of Ljubljana, Faculty of Law, Chair of International Law.

Turku, H. (2018): *The Destruction of Cultural Property as a Weapon of War, ISIS in Syria and Iraq.* London: Palgrave Macmillan.
Rawan, Z (2017): Great, Greatest or Outstanding: Defining Cultural Property in NATO Operational context. *Nato Legal Gazette*, 38, pp. 100–114.

Zakon o varstvu kulturne dediščine [Cultural Heritage Protection Act]. Uradni list Republike Slovenije, No. 16/2008. Ljubljana.

Zidar, A. (ed.) (2019): Ženevske konvencije in Dopolnilni protokoli, II. del – Protokoli. Ljubljana: Založba FDV and MZZ RS.

Internet 1: Instructions for the Government of Armies of the United States in the Field (Lieber Code).

https://ihl-databases.icrc.org/applic/ihl/ihl.nsf/ART/110-20035?OpenDocument (accessed 24 February 2021).

Internet 2: The Hague Regulations concerning the Law and Customs of Wars on Land. https://www.loc.gov/law/help/us-treaties/bevans/m-ust000001-0631.pdf (accessed 24 February 2021).

Internet 3: The Roerich Pact. https://www.researchgate.net/publication/331807988_The_Roerich_Pact_Three_Documents/link/5c8d29a9a6fdcc38175ed0b/download (accessed 3 March 2021).

Internet 4: The Convention for the Protection of Cultural Property in the Event of Armed Conflict. https://www.zvkds.si/sites/www.zvkds.si/files/uploads/files/publication/konvencija_o_vasrtvu_kdvpos.pdf (accessed 9 March 2021).

Internet 5: Drug protokol k Haaški konvenciji o varstvu kulturnih dobrin v primeru oboroženega spopada.
https://ihl-databases.icrc.org/applic/ihl/ihl.nsf/ART/590-15?OpenDocument (accessed 7 April 2021).

Internet 6: Judgement of the International Criminal Tribunal for the Former Yugoslavia in Case No. IT-01-42-T of 31 January 2005 (the Strugar case). https://www.icty.org/x/cases/strugar/tjug/en/str-tj050131e.pdf (accessed 9 March 2021).

Internet 7: Third Amended Indictment of the International Criminal Tribunal for the Former Yugoslavia in Case No. IT-01-42-PT of 10 December 2003 (the Strugar case). https://www.icty.org/x/cases/strugar/ind/en/str-3ai031210e.pdf (accessed 9 March 2021).

Internet 8: https://www.dnevnik.si/334345 (accessed 17 March 2021).

Internet 9: Judgement of the International Criminal Court in Case No. ICC-01/12-01/15 of 27 September 2016 (the al-Mahdi case).
https://www.icc-cpi.int/CourtRecords/CR2016_07244.PDF (accessed 2 April 2021).

Internet 10: https://en.wikipedia.org/wiki/Ahmad_al-Faqi_al-Mahdi (accessed 2 April 2021).

Internet 11: https://www.rtvslo.si/svet/malijski-skrajnez-mora-za-unicevanje-unescove-dediscine-timbuktuja-placati-2-7-milijona-evrov/430270 (accessed 2 April 2021).

Katarina Udovč

Nižinska poselitev iz starejše železne dobe v Mačkovcu pri Novem mestu

Strokovni članek
COBISS 1.04

UDK
902/904(497.4Novo mesto)
903.4(497.4Novo mesto)

Ključne besede: Dolenjska, Novo mesto – Mačkovec, predhodne raziskave, starejša železna doba, dolenjska halštatska skupina, nižinska poselitev, gomile

Izvleček

Arheološko območje Mačkovec pri Novem mestu smo odkrili s predhodnimi raziskavami na trasi avtoceste in poslovno-storitvene cone v letih 1999 in 2006. Raziskave so obsegale vse metode, od ekstenzivnega terenskega pregleda do arheoloških izkopavanj. V območje smo združili več raznovrstnih in različno poimenovanih lokacij iz časa od prazgodovine do mlajšega srednjega veka. V nadaljevanju bomo predstavili eno redkih nižinskih naselbin iz starejše železne dobe na območju dolenjske halštatske skupine. V bližini naselbine smo izkopali dve gomili. Bogato gomilo Mačkovec, o kateri so bili izsledki že objavljeni, bomo primerjali z gomilami na Kapiteljski njivi in v okolici Magdalenske gore. Ovrednotili in dopolnili bomo tipologijo delov ženske in moške noše. Med najdbami po redkosti izstopa lončenina, v gomili s trinajstimi grobovi smo izkopali kar osem različno okrašenih ciborijev. S primerjavo grobnega inventarja želimo dokazati, da ni šlo za nepomemben zaselek, čeprav so se do dandanes od njega ohranile le skromne sledi. V centralnem grobu gomile v Mačkovcu je bila pokopana ženska, v grobu 8 pa svečenica, kar odpira vprašanje namenskosti oziroma funkcije naselja.
V obdobju starejše železne dobe so na Dolenjskem po do zdaj znanih podatkih večinoma živeli v utrjenih naselbinah – gradiščih na vzpetinah. Izven gradišč je znanih zelo malo naselbin (Dular Tecco Hvala, 2007: 145; Dular 2020: 403). Eno redkih smo odkrili v Mačkovcu (*slika 1*). Od pomembnega arheološkega kompleksa v Novem mestu je bila oddaljena približno 2600 m zračne razdalje. Kompleks obsega gradišče na Marofu, plana grobišča iz pozne bronaste in mlajše železne dobe ter gomilne nekropole iz starejše železne dobe.[1] V bližnji okolici Mačkovca do leta 1999 razen miljnika Septimija Severa ni bilo znanih najdb. Omenja se najdba halštatske zapestnice in treh rimskih zlatnikov s Trške gore, medtem ko naj bi bil Bajnof po Pečnikovem mnenju najdišče prazgodovinskih starin (Ansl 1975: 233). Zahodno od Mačkovca, ob lokalni cesti proti Ždinji vasi, leži v gozdu Brezovica še neraziskana gomila s premerom 30 m in ohranjeno višino do 3 m (Križ, 1982: 149). Arheološko sliko območja so dopolnile predhodne raziskave iz leta 1999 na trasi današnje avtoceste in iz leta 2006 na območju poslovno-storitvene cone. Na kmetijskih in gozdnih površinah med Mačkovcem in vznožjem Trške gore (*slika 2*) so izven strnjene pozidave odkrili sledi poselitve iz bronaste, starejše železne in rimske dobe (*slika 3*). V nadaljevanju predstavljamo najsevernejši in najvišje ležeči lokaciji, na katerih so bile odkrite ostaline nižinske neutrjene naselbine ter najmanj dve gomili, ena s trinajstimi grobovi, druga s tremi pokopi. V prvi gomili smo izkopali najdbe v vseh trinajstih grobovih, v drugi pa v dveh. Arheološka najdišča smo poimenovali gomila Mačkovec – gomila I[2] in poslovno-storitvena cona Mačkovec oz. PSCM 1 in PSCM 4 (Udovč, 2008: 178).

1 Starejša literatura je navedena v Križ, 2019.

Katarina Udovč, Zavod za varstvo kulturne dediščine Slovenije, katarina.udovc@zvkds.si

Arheološko območje Mačkovec

Ob ekstenzivnih terenskih pregledih v letu 1999 so na območju trase avtoceste mimo Mačkovca odkrili odlomke prazgodovinske keramike (*slika 2: 1*), ki so nakazali novo arheološko lokacijo (Tica, 1999).[3] V letu 2005 smo v gomili, ki bi jo uničila gradnja avtoceste, dokumentirali in izkopali 13 grobov (*slika 2: 2*) (Udovč, 2009: 5). Po zaključenih izkopavanjih smo na trasi avtoceste ob urejanju brežine opravljali arheološki nadzor in pri tem naleteli na odlomke keramike (*slika 2: 3*). Med njimi smo prepoznali latvici in lonec (*tabla 1: 1–3*). V letu 2006 so potekali intenzivni terenski pregledi območja poslovno-storitvene cone Mačkovec med avtocesto in lokalno cesto ter pobočjem proti Ločni. Na več točkah smo odkrili odlomke keramike iz prazgodovine ter iz rimske in mlajših dob (*slika 3*) (Udovč, 2006). Temu so sledila vrednotenja arheološkega potenciala s strojnimi jarki (Mason, Predan, Britovšek, 2007). Na območjih večje zgostitve najdb smo izvedli arheološka izkopavanja.[4]
Arheološko območje Mačkovec smo razdelili na več najdišč. Pri delitvi smo upoštevali nekdanje in zdajšnje prometnice ter poljske poti (*slika 4*). Na območju PSCM 1 smo odkrili sledi naselbine iz starejše železne dobe (*slika 4: 1*), na območju PSCM 2 pa prazgodovinski vkop in srednjeveško jamo (*slika 4: 2*). Na območju 5[5] (*slika 4: 5*) smo naleteli na sledi poselitve iz srednje bronaste dobe, najdbe pa lahko kulturno opredelimo v virovitiško skupino. Ostanke poselitve iz srednje bronaste dobe smo odkrili tudi na območju južno od lokalne ceste, ki smo ga označili kot PSCM 3 (*slika 4: 3*). Na območju PSCM 4 (*slika. 4: 4*) so raziskali gomilo z dvema skeletnima pokopoma iz starejše železne dobe in rimsko grobišče z 89 grobovi iz 1. in 2. stoletja n. št. (Mason, Britovšek, 2008). Strukture oz. vkope za stojke, jame, ognjišča in keramiko iz bronaste dobe ter še 17 grobov, jarke, kamnolom apnenca in krušno peč iz rimske dobe so odkrili v letu 2010 med območjema PSCM 3 in PSCM 4 (*slika 4: 6*). Južno pod vzpetino Krtinke pa so naleteli tudi na rimsko cesto (*slika 4: 6*) (Murko, 2010; Murko, Omahen, Strašek, 2012; Omahen, 2016). V letu 2020 so potekale raziskave na Ločenskih njivah oziroma na trasi 3. razvojne osi (*slika 4: 7*). Izkopali so odlomke prazgodovinske keramike, ne pa struktur (Predan in Bremec 2020: 150). Arheološka najdišča ležijo na območju pokritega krasa. Geološko podlago sestavljajo bel do siv apnenec, oolitni apnenec, grebenski apnenec s hidrozoji, rjava ilovnata preperina in jerina.[6]

2 Izsledki o gomili so bili že celovito objavljeni (Udovč, 2009).

3 Phil Mason, konservator Zavoda za varstvo kulturne dediščine Slovenije, območne enote Novo mesto, je lokaciji zavaroval kot Novo mesto – arheološko najdišče Brezovica (EŠD 15644) in Novo mesto – arheološko najdišče Lopata nad Mačkovcem (EŠD 15643).

4 Izkopavanja je do leta 2008 izvajal ZVKDS, po letu 2010 pa podjetje PJP pod konservatorskim nadzorom mag. Uroša Bavca in Tine Britovšek (ZVKDS, OE Novo mesto).

5 Vanj smo za tokratno objavo združili najdišča PSCM 5–9.

Naselbinski ostanki na Mačkovcu

Območje raziskav je ležalo na vzpetini z 210 m nadmorske višine (*slike 2; 3; 4: 1*). Z nje je dober razgled na ravnino ob Krki. Izkopavanja so potekala na opuščenih obdelovalnih površinah, zaraslih z drevjem in grmičevjem. Danes območje leži znotraj avtoceste Ljubljana–Obrežje in lokalne ceste Novo mesto–Otočec. Na raziskanem prostoru so zgradili trgovski center.
Arheološka izkopavanja po stratigrafski metodi smo izvedli na 23,5 × 40 m veliki površini, ki je vključevala tudi strojna jarka 26 in 27 (*slika 3*). Izkopavanja so potekala v sušnem obdobju julija 2007, kar je poleg korenin oteževalo prepoznavanje ostalin. Zgornje plasti, rušo in ornico, smo odstranili strojno. Na globini 0,30 m se je začela pojavljati keramika (*slika 5*). Z ročnim izkopom smo nadaljevali do t. i. sterilne ilovnate osnove, ki se je pojavljala na globini 0,45 m pod površjem. Na zahodnem in osrednjem delu izkopa smo naleteli na večje število keramičnih odlomkov. Skupke keramike, vretenca, bruse in železne predmete smo označili kot posebne najdbe (*slika 6*). Skupaj smo dokumentirali 57 stratigrafskih enot, nekatere smo med poizkopavalno obdelavo podatkov izločili, ker se je izkazalo, da je temnejša obarvanost posledica preperevanja korenin ali geološke osnove.
V jugozahodnem delu izkopa se je na globini 0,20 m pojavljala preperela apnenčeva skala v pasovih (SE 013). Drugod je geološko osnovo tvorila ilovnata plast (SE 041). Prekrivale so jo tri po konsistenci in barvi enake kulturne plasti (SE 012, 014 in 018), ki smo jih ločili zaradi različne zgostitve keramike, železove rude in hišnega lepa.
V plasti SE 012 na severovzhodnem delu izkopa smo poleg odlomkov keramike, hišnega lepa in ožgane gline našli tudi železovo rudo. V to plast je bilo vkopanih pet jam za stojke, ki so nakazovale pravokoten tloris stavbe (**objekt 1**) z merami 3 × 2,5 m in usmeritvijo severozahod–jugovzhod (*slika 6*). Po velikosti sta izstopali vzhodna jama za stojko (SE 028), ki je merila 0,55 × 0,44 m, in južna (SE 046), ki se je zaradi korenine s prvotnega premera 0,40 m razširila na 0,80 × 0,95 m. Tri jame za stojke (SE 34, 032, 031) okroglega tlorisa s povprečnim premerom 0,35 m so nakazovale severozahodno stranico objekta. Njihova globina je bila med 0,09 in 0,12 m (*slika 6*).
Sedem metrov jugovzhodno od objekta 1 je bil v plast SE 018 vkopan **objekt 2** (SE 025, SE 024 in SE 023) (*slika 6*). V

6 Osnovna geološka karta in tolmač, list Novo mesto, 1977.

tlorisu je imel obliko pravokotnika z zaobljenimi vogali in merami 5,5 × 3,5 m. Usmerjen je bil zahod–vzhod. Bolje je bila ohranjena njegova severna stranica. Na vzhodni strani ga je poškodoval testni jarek 26 (*slika 3*). V smeri od zahoda proti vzhodu so si sledili ploščati apnenčevi kamni (SE 023). Ležali so na SE 037. Njihova dolžina variira od 0,24 do 0,44 m, širina pa od 0,24 do 0,21 m. Interpretirali smo jih kot kamnite temelje za leseno nadgradnjo. Temno rjava plast ob liniji kamnov (SE 037) je vsebovala odlomke lepa in največ drobcev oglja.[7] V južnem delu objekta sta bili dve jami (SE 045 in SE 020), verjetno za stojki, vkopani skozi SE 024 v SE 041. H konstrukciji sta po vsej verjetnosti sodila tudi dva apnenčasta kamna, velika 0,15 × 0,10 m, ki sta ležala pravokotno na linijo s temeljem (SE 023). S kamnoma velikosti 0,15 × 0,10 in meljasto rjavo ilovico je bil zapolnjen vkop SE 045, ki je dopolnjeval južno linijo temelja. V testnem jarku 26 smo dokumentirali vkopa SE 2603 in SE 2605, ki sta del konstrukcije objekta 2. Sprva so tako SE 2603 kot SE 2605 interpretirali kot vkop za stojko, a se je med izkopavanji izkazalo, da gre pri SE 2603 za del ohranjenih temeljev. V bližini je ležalo še več ploščatih kamnov, zato domnevamo, da je bil objekt 2 poškodovan z novodobno kmetijsko obdelavo.

Notranjost objekta je bila zapolnjena z mastno ilovico (SE 024) svetlo zelenkaste oziroma rumenkasto rjave barve (2.5YR 6/4). Barva in konsistenca sta po vsej verjetnosti posledica preperevanja lesa, saj so se v taki obliki ohranile sledi lesenih krst v gomilah na Kapiteljski njivi v Novem mestu (Križ 2019: 48). V notranjosti objekta 2 so ležali trije zelo korodirani, nedoločljivi železni predmeti, vretence, večji kosi lepa z odtisi vej, drobci oglja in odlomki keramike. Iz odlomkov redukcijsko in oksidacijsko žgane keramike nam ni uspelo sestaviti niti ene cele posode. Po teži oziroma prhkosti keramike in hišnega lepa ter staljeni stekleni jagodi domnevamo, da je bila naselbina ali uničena v požaru ali pa je na tem območju gorelo po opustitvi naselbine.

Z analizo podatkov smo izluščili dva objekta, zgrajena v različnih tehnikah in različno usmerjena. V notranjosti obeh objektov smo odkrili večje kose hišnega lepa z odtisi vej, zunaj njiju pa le drobce. Na raziskanem območju ni bilo živalskih kosti niti ognjišč.

Na raziskanem območju smo izven objektov odkrili tri jame in štiri manjše vkope za stojke (*slika 6*). Vkopi za stojke (SE 009, SE 036, SE 043 in SE 2605) so bili v tlorisu ovalne oblike s povprečno globino 0,10 m. SE 009 in SE 036 sta bili vkopani v SE 014 in zapolnjeni z rjavo meljasto ilovico. Meljasta ilovica je zapolnjevala tudi SE 043 in SE 2605, ki sta bili vkopani v ilovnato geološko osnovo. V zahodnem delu smo v SE 014 oziroma SE 012 dokumentirali tri večje jame (SE 004, SE 2706 in SE 2708). Jami SE 2706 in SE 2708 sta bili dokumentirali med izkopom strojnega jarka 27 in sta del objekta 1. Zapolnjeni sta bili z meljasto ilovico, drobci ožgane gline in odlomki prazgodovinske keramike, medtem ko je bilo polnilo SE 005, ki je zapolnjevalo SE 004, brez najdb.

Najdbe

Od shrambnega, kuhinjskega in servirnega posodja ter kuhinjskih pripomočkov smo izkopali odlomke pitosa, loncev, skled in ročajev pekve. Oblike kuhinjskega posodja se skozi čas niso pogosto spreminjale, prav tako nismo izkopali časovno ožje opredeljivih kovinskih predmetov. Pri poskusu datacije smo se oprli na tipološko kronološko opredelitev Lucije Grahek. Tipološko kronološko opredelitev je osnovala na keramiki iz naselbinskih plasti gradišča v Stični (Grahek, 2016).

Lonec z navznoter nagnjenim ustjem (*tabla 2: 2*) lahko pripišemo tipu L1 po Grahkovi. V Stični je bilo največ takih posod v plasteh ob zidu I, datiranih v stopnji Podzemelj in Stična 1, a se pojavljajo še v latenskodobnih plasteh (Grahek, 2016: 112, slika 53). Podoben lonec je bil odkrit tudi v hiši B na Kučarju (Dular in Ciglenečki, 1995: tabla 15: 3–4). Odlomek pitosa z bradavico (*tabla 1: 9*) smo uvrstili v tip Pi1b. V Stični so pitosi tipa Pi1 zastopani v vseh halštatskodobnih pa tudi v latenskodobnih plasteh, vendar so najpogostejši v plasteh k zidu I do vključno zidu II oziroma od stopnje Podzemelj do stopnje kačastih in certoških fibul (Grahek, 2016: 109, slika 37). Skledo z nekoliko navzven nagnjenim in lijakasto razširjenim ustjem (*tabla 1: 8*) smo uvrstili v tip Sk 11. Tovrstne sklede so med stiško keramiko redke, najdene so bile v plasteh k zidu III in so datirane v mlajše halštatsko obdobje (Grahe, 2016: 161–162, 238–239, slika 47). Podobna skleda je bila izkopana na Libni v plasti skupaj z gubanko, kar potrjuje to datacijo (Vojaković, 2014: 107, tabla 2: 9, 107). Poleg keramičnih odlomkov v skupni teži 5 kg smo našli še bruse (*tabli 1: 4; 2: 7, 8*), vretenca (*tabla 2: 4, 5, 9*), tri nedoločljive odlomke železa, odlomke kamnitih žrmelj (*tabli 1:* 5; *2: 1*) in diskasto jagodo iz modrega stekla (*tabla 2: 3*) ter ročaj pekve (*tabla 2:* 6). Brusne kamne in vretenca so na Dolenjskem v halštatski dobi pridajali tudi v grobove kot znak rokodelcev (Teržan, 1999a), odlomki žrmelj pa so na splošno pogoste naselbinske najdbe.

Naselbinske ostanke smo časovno opredelili v starejšo železno dobo na osnovi odkritih odlomkov železnih predmetov in načina gradnje. V starejši železni dobi naj bi prevladovala sohasta gradnja, na ta način so zgrajeni objekti v gradiščih (Dular; Tecco Hvala, 2007: 122; Dular, 2008: 340). Domnevamo, da je bil v tej tehniki zgrajen objekt 2. Po skledi z lijakastim ustjem (*tabla 1: 8*) pa lahko poselitev na tem območju ožje datiramo v mlajše halštatsko obdobje oziroma v stopnji kačastih in certoških fibul. To datacijo nakazujejo tudi najdbe iz bližnje gomile I z Mačkovca, v kateri smo izkopali podobna vretenca, bruse in modre steklene jagode (*slika 9*).

7 Vzorcev oglja zaradi razdrobljenosti nismo vzeli.

Gomila I iz Mačkovca

Leta 2005 smo severno od naselbinskih ostankov izkopali gomilo I (*slika 2: 2*). Ležala je ob robu gozda, od koder se začne teren proti severu postopoma dvigovati proti Sevnemu in naprej proti 428 m visoki Trški gori, na zahodu pa proti 266 m visokemu, z gozdom poraslemu hribu Brezovica (*slika 1*). Proti jugovzhodu se teren zlagoma spušča proti naselju Mačkovec in naprej proti reki Krki.

Gomila je imela skoraj okrogel tloris s premerom 14 m in 1,5 m visoko ohranjeno zemljeno nasutje. Plašč gomile so nasuli na apnenčevo skalo (*slika 7*). Raziskali in dokumentirali smo 13 grobov, ki so bili polkrožno razporejeni okrog groba 9. Grob 9 je centralni in hkrati najstarejši grob v gomili (*slika 8*). Ta grob je imel ohranjene sledi krste in kamnito konstrukcijo, v katero so bile vključene tudi štrline žive skale. Na preperel apnenec smo naleteli tudi pod sprhnelimi krstami oziroma pridatki v grobovih 1, 3, 4, 8, 9, 12 in 13. Omenjeni grobovi so bili v celoti ali pa vsaj delno vkopani v t. i. sterilno osnovo oziroma ilovico (SE 006), medtem ko so grobovi 2, 5, 6, 7, 10 in 11 ležali v nasutju gomile (SE 004) (*sliki 7 in 8*). Vkopi oziroma polnila grobnih jam so se slabo ločili od okolice. Zaradi slabe vidnosti so v nekaterih primerih mlajši grobovi poškodovali starejše, npr. grob 6 je poškodoval grobova 10 in 11, grob 1 pa grob 2. Glede na najdbe so bile določene tudi meje groba 7 (*slika 8*). Da so pokojnike tudi tu pokopavali v krstah, potrjujejo ohranjene sledi lesa v grobovih 8, 9 in 13.

Sodeč po obliki in velikosti grobnih jam ter legi pridatkov, so bili grobovi skeletni. Človeške kosti in lesene krste se razen skromnih sledi tako kot v večini drugih primerov na Dolenjskem tudi tu niso ohranile zaradi kisle in agresivne ilovice. Le v grobovih 8 in 13 so se ohranili zobje ter v grobu 5 sledi dolgih kosti. Antropološka analiza je pokazala, da je bil v grobu 13 pokopan otrok, star okoli štiri leta ali kako leto več, v grobu 8 pa domnevno ženska (Leben–Seljak, 2009: 84, 85). Druge pokope smo lahko po spolu opredelili po pridatkih; ti so bili odkriti v vseh 13 grobovih (*slika 9*). Po značilnih ženskih pridatkih (nakit) in moških opravah (orožje in orodje) sklepamo, da je bilo v gomili pokopanih sedem žensk (grobovi 1, 2, 5, 7, 8, 9, 11), štirje moški (grobovi 3, 6, 10, 12) in en otrok (grob 13). V enem primeru spola pokopane osebe ni možno opredeliti, ker je bila lončenina edini pridatek (grob 4). Po legi lončenine je mogoče sklepati na smer pokopa. V dolenjski halštatski skupnosti so posode običajno položili k nogam, medtem ko so deli oprav in nakit ležali na mestih, kjer so jih pokojniki nosili ob pokopu. Pokopi so si v zahodni polovici sledili v smeri urnega kazalca, v vzhodni polovici pa v nasprotni smeri, centralni grob 9 pa je bil usmerjen sever–jug z manjšim odklonom proti zahodu (*slika 8*).

Najdbe oziroma gomilo bomo primerjali z istočasnimi grobovi iz gomil na Kapiteljski njivi. B. Križ je analiziral 921 grobov v 69 gomilah in 3846 predmetov, od tega je 86 grobov uvrstil v kačasto in 176 v certoško stopnjo (Križ 2019).[8] Pri kronološki umestitvi bomo upoštevali delitev starejše železne dobe, kot jo je zasnoval Stane Gabrovec.[9]

Deli ženske noše

Obročast nakit spada med najpogostejše pridatke v ženskih grobovih. Popolnih ženskih oprav z uhani ali lasnimi obročki, zapestnicami in nanožnicami, fibulami ter steklenimi in jantarnimi ogrlicami na Mačkovcu nismo izkopali (*slika 9*). V grobovih 1, 5, 8 in 11 pokopane osebe so imele masivne bronaste, enakomerno narebrene zapestnice ali nanožnice okroglega preseka. Zapestnice so sklenjene. Izjemi sta drobnejši zapestnici iz groba 8, ki imata stanjšana presegajoča konca. Nanožnice so lahko sklenjene (groba 5 in 8), lahko imajo presegajoča konca (grob 11) ali pa se konca dotikata (grob 1) (Udovč, 2009: 24, slike 15, 22, 34).[10] Enakomerno narebrene sklenjene obroče lahko uvrstimo v tip IIIa po Tecco Hvala, tiste s presegajočimi konci pa v tip IIIc (Tecco Hvala, 2012: 301, 306–307).[11] Datirani so v mlajše halštatsko obdobje, v stopnji kačastih in certoških fibul (Božič, 2018: 202). Masivne narebrene nanožnice so ena od značilnosti dolenjske halštatske noše, saj sta dolenjskim primerljiva primerka nanožnic znana le še iz Hallstatta (Grahek, 2004: 148). Na Kapiteljski njivi so v grobovih, ki jih uvrščamo v kačasto in certoško stopnjo, izkopali enako število nanožnic, in sicer 16 v 8 grobovih (Križ, 2019: 85, seznam 21).Na mestu nošnje so v grobu 1 izkopali par nanožnic (Udovč, 2009: 12, sliki 15 in 16). Po obliki ju uvrščamo v tip IIIb (Tecco Hvala, 2012: 302, slika 111: 2). V grobovih 5, 8, 11 so zapestnice ali nanožnice ležale na sekundarnem mestu in ne na mestu nošnje oziroma ob zapestjih ali gležnjih. V grobu 11 so ležale ob zgornjem delu pokojničinega telesa (Udovč, 2009: sliki 34 in 35). V grobu 5 so jih skupaj z zapestnicama tipa IVc (Tecco Hvala, 2012: 301, slika 111: 12) položili na oprsje pokojnice. Domnevamo, da je temna barva sled organskega materiala ali mošnjička ali šatuljice, v kateri so bile nanožnici in zapestnici spete s fibulo ter iglo (Udovč, 2009: 15 sliki 22 in 23). Tudi v grobu 8 sta masivnejši zapestnici ležali v predelu prsnega koša, medtem ko sta bili gracilnejši najdeni v predelu zapestij (Udovč, 2009: 24, slika 28, G49–50, G52–53). Lega narebrenega nakita je bila pri izkopavanjih s konca 19. in začetka 20. stoletja redko dokumentirana. Poleg Mačkovca je zabeležena na prsnem ali zgornjem delu telesa v grobovih V/2, VII/40 na Magdalenski gori (Hencken, 1978: 356, slika 102), v Novem mestu (Kapiteljska njiva grob 3/19 (Križ, 1997: 63–66, tabla 47) in Kandija groba 3/3, 3/33

8 Križ, 2019; 241 grobov je bilo brez pridatkov.

9 Gabrovec, 1964–1965; Gabrovec 1987.

10 Konca se dotikata: G5–6, G74; sta sklenjena: G27–28; sta presegajoča: G73.

11 Z navedenimi najdišči in citirano literaturo.

(Knez, 1986: 61, tabla 59)), v grobu 26 z metliške nekropole Hrib (Grahek, 2004:160, slika 45) in v grobu 30/4 iz Ivanca pri Družinski vasi (Guštin, Križ, 2007: 498) ter v grobu 2 na Grofovih njivah pri Drnovem (Pavlovi, 2018: 357, slika 4). Noši iz grobov 9 in 8 na Mačkovcu lahko primerjamo z rekonstruiranima nošama 3 in 4 z Vač in iz Stične, kot jih je opredelila Teržanova (Teržan, 1985: 92). Nanožnice so bile praviloma pridane le v najbogatejših grobovih odraslih žensk oziroma so bile del bogatejših oprav (Teržan, 1985: 88, slika 11; Tecco Hvala, 2012: 309). Skupaj z zapestnicami, ogrlicami iz steklenih ali jantarnih jagod ali fibulami in lasnimi obročki ter posodami so nanožnice izkopali v stiški gomili 48, v grobovih 29 in 131, in v grobovih 4 in 13 iz gomile 5 (Gabrovec et al., 2008: table 24: 1–4; 76: 4–5; 109–110). Rebrast stil okraševanja obročastega nakita je značilen za 6. stoletje pr. n. št. (Teržan, 1974: 41). Tak nakit se je v grobovih dolenjske skupine pojavil že v horizontu Stična 2, priljubljen pa je bil predvsem v stopnji kačastih fibul (Gabrovec, 1987: 59), a se je obdržal še v certoški stopnji (Božič, 2018: 202). Tudi obsenčni obročki s presegajočimi konci, tip III po Tecco Hvala, označujejo modo 6. stoletja pr. n. št. (Tecco Hvala, 2007: 478–479). Kombinacija obsenčnih obročkov, jantarne ogrlice in kačaste fibule s krilci iz groba 9 je znana iz gomile 13 na Prelogah v okolici Magdalenske gore (Tecco Hvala, 2012: 328).

Fibule. V petih grobovih smo izkopali skupno devet fibul, pri čemer lahko trakast predmet iz groba 5 (Udovč, 2009: 24, G24, grob 8: G48, grob 9: G59, grob 10: G65–G66, grob 6: G29–32) pogojno uvrstimo med fibule. V grobu 8 je bila gracilna trortasta fibula tipa VII po Ogrinovi ali Vinkov vrh, kakršne so nosili v stopnji certoških fibul. Ta tip je znan na Dolenjskem in v Posočju, posamični primerki so zabeleženi še ob srednjem in južnem toku Save (Donja Dolina, Sremska Mitrovica) in eden na japodskem teritoriju v Jezerinah (Ogrin, 1998: 127). V grobu 9 je bila kačasta fibula različice Va po Tecco Hvala (Tecco Hvala, 2014: 133), značilna za istoimensko časovno stopnjo, v grobu 10 pa njena različica VIIc (Ib., 138; 154–155) skupaj s certoško fibulo, ki po vsej verjetnosti pripada II. vrsti po Teržanovi. Grob 6 je vseboval štiri certoške fibule tipa XIII (Teržan, 1976: 359–360, slika 30). V paru so jih nosili moški v pozni certoški in zgodnji negovski stopnji. Poleg dveh parov fibul so bili v tem grobu še šilo, brus, železen nož ter štiri jantarne in ena modra steklena jagoda z belo valovnico.

Scepter. V grobu 8 je bil poleg lončenine, narebrenega obročastega nakita, trortaste fibule, vretenca in ogrlice iz steklenih jagod tudi poškodovan bronast scepter z geometrijskim okrasom in s trikotnimi obeski, okrašenimi z iztolčenimi bunkicami (Udovč, 2009: 26, G51). Sceptri so na splošno redke najdbe. Na Kapiteljski njivi v Novem mestu so bili pridani le v bogatih ženskih grobovih, in sicer v uničenem grobu gomile 1, ki ga je Križ poimenoval kot najdba 1/1989 (Knez, 1993: tabla 38), in v grobu 2 gomile 29 (Križ, 2019: 83). Po okrasu z izmenjajočima se pasovoma mrežastega ornamenta in vodoravnih linij na vratu je scepter z Mačkovca podoben primerku iz Rovišča (Stare, 1973: 735, t. 4: 2), po zaključni ploščici na vrhu pa najdbam iz gomilne nekropole Preloge na Magdalenski gori (Tecco Hvala, 2012, slika 125: 7, 12). Sceptre oziroma kultne palice so uporabljale svečenice, ki so pripadale višjemu sloju halštatske družbe.

Deli moških oprav

Orožje je bilo najdeno v grobovih 3 in 12 (*slika 9*). V grobu 3 so bili sulična ost, sekira z enostranskimi stikajočimi plavutmi,[12] nož in šilo ter triperesni obesek (Udovč, 2009: 26, G12, G13, G14 in G15), v grobu 12 pa sulična ost, šilo in pasna spona (Ib., 26, G77, G 78, G79). Take sekire se pojavljajo v grobovih dolenjskih bojevnikov v negovski stopnji (Tecco Hvala, 2012: 118). Železne pravokotne pasne spone so na Dolenjskem zastopane v bogatejših skeletnih grobovih z orožjem in v kombinaciji s kačastimi fibulami ali s sedlastim lokom ali s krilci pa tudi s certoškimi fibulami XIII. vrste (Tecco Hvala, 2012: 168–169). V ostalih grobovih, ki smo jih opredelili kot moške, je bilo rokodelsko orodje, kamor uvrščamo šilo, brus in nože (*slika 9*).

Lončenina

Lončenina je bila pridana domala v vse grobove, razen v grob 6 (*slika 9*). Prevladujejo ciboriji, sledijo jim latvice in vretenca. V petih grobovih smo odkrili osem ciborijev. V grobovih 1, 7 in 10 sta bila po dva ciborija, po eden pa v grobovih 5 in 3. Ciborije lahko uvrstimo k tipom 3, 4, 5 in 10 po Dularju (Dular, 1982: 85). Ostenja imajo okrašena z bradavicami ali vertikalnimi rebri in kombinacijo obojega ter z apliciranimi bovidi, nagubanim ostenjem ali v kombinaciji gubanja in protomov. Le eden je bil neokrašen, drugi so rdeče barvani s črnimi pasovi (Udovč, 2009: 27, G1, G2, G38, G39, G61, G62, G11, G18). Najbližje primerjave najdemo na Kapiteljski njivi v Novem mestu, kjer so ciboriji pridatek bogatejših, predvsem ženskih grobov (Križ, 2019: 98).[13] Tam so v 45 grobovih našli 56 ciborijev, najstarejši so trije iz kačaste stopnje. Sicer se ta oblika posode pojavi že v horizontu Stična 1 (Dular, 1982: 44), a največji razcvet tako oblikovno kot tehnološko doživi v certoški stopnji. Običajno so imeli pokrove, na Mačkovcu jih je bilo pokritih šest. Rdeče barvanemu ciboriju z narebreno nogo in z gumbastim držajem na pokrovu iz groba 5 z Mačkovca sta podobna ciborija iz groba 15 knežje gomile 3 na novomeški Kapiteljski njivi (Udovč, 2009, G18; Knez, 1993, tabla 15: 2).

12 Sekira iz groba 3 je bila zaradi močne korozije sprva opredeljena kot tulasta (Udovč, 2009, 26, G15). Po ponovnem restavratorskem posegu se je izkazalo, da gre za sekiro z enostranskimi plavutmi.

13 Osemnajst jih je bilo priloženih 16 pokojnicam, le šest pa petim pokojnikom, ostali so pripadali grobovom, ki po spolu niso določljivi.

V gomili na Mačkovcu je imelo šest posod nagubano ostenje. Tri od teh so pripadale grobu 10 (dva ciborija in skleda), v grobu 7 je imel nagubano ostenje ciborij, v grobovih 2 in 11 pa skledi (*slika 9*) (Udovč, 2009, 27, grob 2: G7, grob 7: G39, grob 10: G61–63, grob 11: G70). Na Kapiteljski njivi v Novem mestu sodijo najstarejši primerki gubank, tako kot ciboriji, v stopnjo kačastih fibul. Največ jih spada v stopnjo certoških fibul (47 posod iz 42 grobov). V tej stopnji se pojavljajo v bogatih, predvsem ženskih grobovih (Križ, 2019: 99). Dular je pojav gubanja datiral v stopnjo kačastih fibul, ta način okraševanja posod pa opredelil kot značilnost dolenjske skupine, saj se izven tega območja le redko pojavlja (Dular, 1982: 85). Teržanova meni, da se je tovrstni okras pojavil že prej, v stopnji Stična 2, kamor datira skledo z nagubanim ostenjem, odkrito v Stični v hiši 1, v sondi 18 (Teržan, 1990: 68; 1994b: 122, tabla 1: 9). Na zgodnejši pojav od stopnje certoških fibul kaže tudi gubanka s Silovca nad Orešjem, najdena v plasti, ki je radiokarbonsko datirana v čas 2510 ± 25 BP (Kovač, 2014: 512, sliki 29, 4: 7; Teržan, Črešnar, 2014: 716, slike 41, 42, 44). Ciboriji in t. i. gubanke se v bogatejših grobovih pojavljajo tudi v gomilah na Magdalenski gori (Tecco Hvala, 2012: 353), medtem ko so v gomilah iz Dolenjskih Toplic, v katere so pokopovali v certoški in negovski stopnji, izjemno redki.14 V grobu 7 smo izkopali pivski servis – čašo, ciborija in skodelico s presegajočim ročajem (*slika 9*) (Udovč, 2009: 54–58, G38–41). Na Kapiteljski njivi so skrbno izdelane skodelice s presegajočim ročajem izkopali tako v ženskih kot v moških grobovih. Pojavljajo se v vseh časovnih stopnjah. V starejših obdobjih so pogostejše, iz stopnje Podzemelj jih je 13, iz Stične 17, medtem ko lahko v kačasto časovno uvrstimo le 2, v certoško 9, v negovsko stopnjo pa 6 posod. Običajno so del pivskega servisa, zato jih le redko najdemo kot edino posodo v običajno bogatih grobovih. Še redkejši so pivski servisi, saj se v stopnji kačaste fibule pojavi 1, v stopnji certoške fibule pa 5 (Križ, 2019: 96, seznam 28).

Struktura gomile

Gomilo po številu grobov v okviru dolenjske skupine uvrščamo med manjše družinske gomile, značilne za spodnji tok reke Krke. Po številu grobov je primerljiva z molniškimi gomilami, ki so štele od 10 do 14 grobov (Tecco Hvala, 2017: 126). Na Kapiteljski njivi v Novem mestu je bilo med 69 raziskanimi gomilami 18 takih, ki so vsebovale od 11 do 20 pokopov (Križ, 2019: 146).

Grobni pridatki kažejo, da so v gomilo I na Mačkovcu začeli pokopavati ob koncu stopnje kačastih fibul (grob 9). Največ pokopov je iz stopnje certoških fibul (grobovi 1, 2, 4, 5, 7, 8, 10, 11, 12 in 13), prenehajo se na prehodu v negovski horizont. Vanj bi lahko uvrstili grobova 3 in 6. Po bogastvu najdb je gomila I na Mačkovcu primerljiva z gomilami na Kapiteljski njivi v Novem mestu in na Magdalenski gori, ki so vsebovale grobove premožnejših oseb. Po najdbah odstopa od drugih posamičnih gomil, ki naj bi pripadale do zdaj še neugotovljenim neutrjenim naseljem (Dular, 2003; Dular, Tecco Hvala, 2007: 149). Čeprav v gomili na Mačkovcu ni bilo uvoženih in luksuznih predmetov, kot je npr. bronasto posodje, se zdi, da so bili v njej pokopani pripadniki premožnejše družine, ki je sodila v višji sloj takratne družbe.

Pri gomili je treba izpostaviti tudi centralni grob. Najstarejši grob v gomili je bil centralni grob, grob 9. V njem je bila pokopana ženska oseba. Za primerjavo naj omenimo, da so na Kapiteljski njivi v Novem mestu centralne grobove odkrili v 20 od skupaj 69 gomil. Po pridatkih so sedem centralnih grobov opredelili kot ženske, datirani pa so večinoma v stopnjo Podzemelj 2 (Križ, 2019: 113). V večini primerov je bila v dolenjski halštatski kulturni skupini v centralnem grobu pokopana oseba moškega spola (Teržan, 2008: 201).

Južno od gomile I in severozahodno od naselbine smo opazili še tri okrogle izbokline, ki so spominjale na gomile. Domnevo smo preverili s testnimi sondami in ugotovili, da je izbočenost posledica različne višine oziroma lege apnenčaste geološke podlage in njenega preperevanja. Na omenjenem območju smo izkopali nekaj odlomkov prazgodovinske keramike.

Gomila II iz Mačkovca

Na območju PSCM 4 južno od naselbine so v letu 2007 raziskali še najmanj eno gomilo (*sliki 4: 4; 12: 12*). V prvi gomili so dokumentirali dva skeletna grobova z najdbami in enega brez njih. V bližini je bilo krožno razporejenih še pet vkopov podobne velikosti brez najdb, domnevamo, da gre za grobove brez pridatkov (*slika 10a*). Ob gomili II so izkopali 110 žganih grobov iz rimske dobe (*slika 10b*).[15] V najbogatejšem grobu so izkopali narebreni zapestnici in nanožnici s presegajočima koncema, ciborij z nagubanim ostenjem, ciborij s pokrovom, čašo in vretence (*slika 11*) (Mason, Britovšek, 2008). Najdbe sodijo v čas stopnje certoških fibul tako kot najdbe iz gomile I.

Diskusija

Gomili in naselbina na Mačkovcu ležijo na meji oziroma že izven teoretično določenega teritorija gradišča na Marofu v

14 Dular, J. 1982, T. 6: 40; 7: 52, 56, 59, 60; 8: 62, 63, 66, 68, 69; 9: 82, 86; 10: 93, 97–99; 20: 173; 24: 220, 235; 26: 255; Teržan, 1976: 385, T. 1–91.

15 Stratigrafija grobov v gomilah in odnos do grobišča iz rimske dobe ter najdbe bodo podrobneje predstavljeni v sklopu celostne obdelave najdišča PSCM 4. Vodja arheoloških izkopavanj je bil dr. Phil Mason.

Novem mestu, od katerega so oddaljeni 2,7 km zračne linije. Da poselitev ni bila omejena zgolj na gradišče, dokazujejo raziskave na okljuku Krke oziroma v srednjeveškem jedru Novega mesta od leta 2000 naprej.[16] Grobišča se razprostirajo v radiju 1,5 km (*slika 12*). Na levem bregu Krke se v neposredni bližini prazgodovinskega gradišča na vzpetini Marof (*slika 12: 1*) razprostira gomilno grobišče na Kapiteljski njivi (*slika. 12: 2*), vzhodneje na platoju pa še plano grobišče Mestne njive (*slika 12: 3*). Na desnem bregu Krke si od zahoda proti vzhodu sledijo gomile v Portovalu (*slika 12: 4*), Kandiji (*slika 12: 5*), Zagrebški cesti (*slika 12: 6*), Malenškovi njivi (*slika 12: 7*), Smolovi hosti (*slika 12: 8*) in Smolenji vasi (*slika 12: 9*). Glede na domnevo, da so gomile postavljali ob poteh in na križiščih teh, bi gomile lahko nakazovale potek komunikacije na desnem bregu Krke. Lega gomil skupaj z najdbami odlomkov keramike v vrtači na Grabnu (*slika 12: 10*) (Lavrinc, 2014: 11) in ožgane gline v bližini Ragovega (*slika 12: 11*) (Križ, 1981: 156) nakazujejo morebiten prehod čez Krko. Od tam naprej je pot nemara vodila mimo gomil in naselbine na Mačkovcu (slike *12: 12, 13 in 14*), kjer se je ob vznožju Trške gore pridružila trasi glavne poti z zahoda proti vzhodu (Tecco Hvala, Dular, 2007: 222) oziroma proti Velikemu Vinjemu vrhu. To traso nakazujejo domnevne gomile Brezovica (*slika 12: 15*), Jakovec (*slika 12: 16*), Farovške njive pri Otočcu. Druga možna komunikacija z vzhodne smeri pa je morda vodila na Marof mimo Mačkovca in Mestnih njiv, medtem ko ob današnji zahodni mestni vpadnici, razen v Bršljinu ob vznožju Marofa, ni dokumentiranih najdišč.

Podobno sliko razkriva drugo pomembno halštatsko središče ob spodnjem toku Krke z utrjenim naseljem na Velikem Vinjem vrhu in s številnimi gomilami ter planim grobišči v bližnji okolici. Tisoč štiristo metrov zračne razdalje od gradišča so v nižini, na trasi današnje avtoceste izkopali naselbinske ostanke v Beli Cerkvi – pod Vovki, 400 m vzhodneje pa tudi gomile na Dolgih njivah.

Na sledi nižinske poselitve iz starejše železne dobe so z arheološkimi terenskimi raziskavami pred načrtovano gradnjo avtoceste naleteli tudi na Grofovih njivah pri Drnovem, bližje sotočju Krke in Save (Pavlovič, 2007: 76; ista 2014). Odkrili so ostanke domnevno devetih stavb, razporejenih vzhodno in zahodno od poti, v bližini pa še manjšo gomilo s petimi grobovi. Ohranjeni pridatki iz teh grobov kažejo na pokope v certoški stopnji. O sočasnosti naselbine pa je mogoče sklepati po podobni lončenini (Pavlovič, 2014: 491–504). Vretenca, kamnite žrmlje, drobce glinastega stenskega premaza in ruševine kamnitega temelja so izkopali v nižinski naselbini na Marjanovem hribu pri Studencu (Svoljšak, 2008: 85, slika 157).

16 Na križišču Rozmanove in Kapiteljske ulice so v koluvialnih plasteh odkrili odlomke keramike iz starejše železne dobe (Tiran 2017), na Rozmanovi ulici pa poleg odlomkov tudi vkope za stojke in kurišče iz tega časa (*slika 15: 17*) (ustni podatek nadzornika arheološke raziskave mag. Uroša Bavca, ZVKDS, OE Novo mesto).

Kakšen je bil značaj teh nižinskih neutrjenih naselij iz starejše železne dobe, ali gre za kratkotrajno poselitev, zaselke, posamezne kmetije v zaledju večjih centrov, je težko odgovoriti, ker so bila naselja le delno raziskana. Njihov obseg je težko določiti, saj na površju ni videti mejnih struktur. Po orodjih in pripomočkih (npr. žrmlje, vretenca) in živalskih kosteh, odkritih v naselbinskih plasteh, lahko sklepamo, da so se prebivalci ukvarjali s poljedelstvom in živinorejo ter rokodelstvom. Grobni pridatki pa kažejo na njihov dokaj premožen status. Presenetljiva najdba v enem od grobov iz mačkovške gomile je scepter, ki jih običajno pripisujejo svečenicam.

Katalog najdb

Najdbe hrani Dolenjski muzej Novo mesto. Pri opisu keramičnih najdb smo se naslonili na parametre, ki jih je osnovala Milena Horvat (1999, 16, 31).

Seznam okrajšav
d. – dolžina
ohr. – ohranjen
pr. – premer
rek. – rekonstruiran
š. – širina
v. – višina
db. – debelina

Tabla 1

1. Odlomek ustja latvice. Sestava: finozrnata; površina: gladka; barva: sivkasto rjava (10YR 5/2). Rek. pr. 22, cm, ohr. d. 5,3 cm, ohr. š. 3,4 cm, db. 0,6–1,1 cm.
2. Odlomek ustja latvice. Sestava: finozrnata; površina: gladka; barva: neenakomerna od svetlo rdečkasto rumene (5YR 6/4) do svetlo rjavkasto sive (10YR 6/3). Rek. pr. 19,5 cm, ohr. v. 2,8 cm, ohr. š. 2,9 cm, db. 0,6 cm.
3. Odlomek ustja lonca. Sestava: finozrnata; površina: gladka; barva: zelo bledo rjava (10YR 7/4). Rek. pr. 22,7 cm, ohr. v. 3,65 cm, ohr. š. 4,3 cm, db. 0,7 cm.

Stratigrafska enota 008
4. Delno ohranjen kamnit brus. Ohr. d. 12,5 cm, ohr. db. 1,5–3 cm; inv. št. P7201.
5. Odlomek kamnitih žrmelj. Ohr. d. 6,9 cm, ohr. š. 5,7 cm; inv. št. P7202.
6. Ročaj. Sestava: finozrnata, površina: gladka; barva: rdečerjava (2,5YR 4/3), žganje: oksidacijsko. Ohr. d. 3,2 cm, ohr. š. 3,6 cm, db. 2,7 cm.

Stratigrafska enota 012
7. Odlomek dna lonca. Dno klekasto prehaja v ostenje. Sestava: grobozrnata, površina: hrapava; barva: temno rjava (10YR 3/2), prelom: črn; žganje: redukcijsko. Rek. pr. 13,4 cm, ohr. d. 5,9 cm, ohr. v. 4 cm.
8. Odlomek ustja sklede. Ustje se navzven lijakasto razširi, tik pod ustjem je podolgovata bradavica. Sestava: drobnozrnata, površina: hrapava; barva: neenakomerna od zelo bledo rjave (10YR 7/4) do temno sive (10YR 4/1); prelom: črn; žganje: stihijsko. Rek. pr. 18,5 cm, ohr. d. 4,7 cm, ohr. š. 3,4 cm, db. 0,6 cm.
9. Odlomek pitosa, na najširšem obodu je aplicirana bradavica. Sestava: drobnozrnata, površina: hrapava; barva: rumenkastordeča (5YR 5/6), prelom: jedro temne barve, površini svetli; žganje: redukcijsko v končni fazi vzpostavljena oksidacijska atmosfera. Rek. pr. 33 cm, ohr. d. 7,8 cm, ohr. š. 4 cm, db. 0,78 cm.

Tabla 2

1. Odlomek kamnitih žrmelj. Ohr. d. 9,3 cm, db. 6,6 cm, ohr. š. 7,6 cm; inv. št. P7203.

Stratigrafska enota 014
2. Odlomek ustja lonca. Ustje je nagnejo navznoter in ravno odrezano. Sestava: drobnozrnata, površina: hrapava; barva: rdečerjava (2,5YR 4/3), prelom: jedro temne barve, površini svetli; žganje: redukcijsko v končni fazi vzpostavljena oksidacijska atmosfera. Rek. pr. 15 cm, ohr. d. 6,2 cm, ohr. š. 5 cm, db. 0,85 cm.
3. Poškodovana jagoda iz modrega stekla. Staljena. Jagoda je na koncih sploščena. Pr. 1,7 cm; inv. št. P7204.
4. Glineno vretence, bikonične oblike. Sestava: finozrnata; površina: gladka; barva: rjava (10YR 5/3). Pr. 3,9 cm; inv. št. P7205.

Stratigrafska enota 018
5. Glineno vretence, polkrožne oblike. Sestava: drobnozrnata; površina: hrapava; barva: temno sivo rjava (10YR 4/1). D. 4,2 cm; v. 3 cm, db. 1,25 cm; inv. št. P7206.
6. Delno ohranjen ročaj pekve. Sestava: grobozrnata; površina: hrapava; barva: rdeča (2,5YR 4/6). Ohr. d. 4,5 cm, ohr. š. 4, 4 cm, db. 2 cm; inv. št. P7207.

Stratigrafska enota 024
7. Kamnit brus. Ohr. d. 9,7 cm, ohr. š. 6,3 cm, db. 2,7 cm; inv. št. P7208.
8. Kamnit brus. Ohr. d. 4,9 cm, ohr. š. 3,3 cm, db. 0,9 cm; inv. št. P7209.
9. Poškodovano, močno prežgano glinasto vretence. Ohr. v. 2,7 cm; inv. št. P7210.

Zahvala

Zahvaljujem se Petri Stipančić in Simonu Bobnarju iz Dolenjskega muzeja, dr. Phillu Masonu, Anđelki Fortuna Saje in Danilu Cvetku iz ZVKDS, CPA. Petra Stipančić je gradivu določila inventarne številke. Simon Bobnar je ponovno restavriral oziroma očistil železno sekiro iz groba 3 iz mačkovške gomile I.
Dr. Phill Mason je dovolil objavo tlorisov gomil iz Mačkovca. Anđelka Fortuna Saje je zrisala predmete iz naselbine Mačkovec (PSCM1), Danilo Cvetko je dopolnil stare in izdelal nove grafične priloge.

Povzetek

V prispevku smo predstavili nižinsko naselbino in gomile v Mačkovcu pri Novem mestu. Gomilo I smo po izkopanih pridatkih uvrstili med bogatejše gomile znotraj dolenjske halštatske skupine (sliki 8 in 9). V gomilo je bilo vkopanih 13 grobov, vsi grobovi so imeli pridatke. Vanjo so pokopavali od kačastega horizonta do prehoda iz stopnje certoške fibule v negovsko stopnjo. Med raznovrstnimi pridatki smo izkopali posode z nagubano površino, ciborije, narebren nakit, orožje in scepter. Gomila od večine dolenjskih gomil odstopa tudi po tem, da je bila v centralnem in najstarejšem grobu 9 pokopana oseba ženskega spola. Južno od gomile je bila naselbina z dvema objektoma (slika 6). Manjši objekt 1 je bil zgrajen s stojkami, večji pa v kombinaciji sohaste gradnje in stojk. Na območju naselbine smo izkopali svitke, žrmlje, bruse, odlomke posod in stekleno jagodo, vretenca, ročaj pekve, hišni lep z odtisi vej. Najdbe uvrščajo naselbino v čas stopnje certoške fibule. Južno od naselbine so po vsej verjetnosti izkopali še dve gomili. Pridatke, ki gomilo oziroma pokope uvrščajo v čas certoške fibule, so izkopali le v dveh grobovih južnejše gomile II (slika 10).

Literatura

ANSl (1975): *Arheološka najdišča Slovenije*. – Ljubljana.

BOŽIČ, D. (2018): Grave 20 in Tumulus IV: Hallstatt-period burial of a woman at Znančeve njive in Novo mesto. Halštatski ženski grob 20 iz gomile IV na Znančevih njivah v Novem mestu. *Arheološki vestnik* 69, str. 179–207.

DULAR, J. (1982): *Halštatska keramika v Sloveniji. Die Grabkeramik der älteren Eisenzeit in Slowenien: prispevek k proučevanju halštatske grobne keramike in lončarstva na Dolenjskem*. Dela 1. razreda SAZU 23.

DULAR, J. (2003): *Halštatske nekropole Dolenjske/Die hallstattzeitlichen Nekropolen in Dolenjsko.* Opera Instituti Archaeologici Sloveniae 6.

DULAR, J., TECCO HVALA, S. (2007): *South-Eastern Slovenia in the Early Iron Age. Settlement – Economy – Society/Jugovzhodna Slovenija v starejši železni dobi. Poselitev – gospodarstvo – družba.* Opera Instituti Archaeologici Sloveniae 12.

DULAR, J. (2008): Prazgodovinske lesne gradbene tehnike in njihova terminologija. *Annales: anali za istrske in mediteranske študije. Series historia et sociologia* 18.2., Koper, str. 337–348.

DULAR, J. (2020): Nova spoznanja o poselitvi Dolenjske v starejši železni dobi. On the Early Iron Age settlement pattern of Dolenjska. *Arheološki vestnik* 71, str. 395–421.

DULAR, J. (2021): *Gradivo za topografijo Dolenjske, Posavja in Bele krajine v železni dobi.* Zbirka E-Monographiae Instituti archaeologici Sloveniae, 10/1; 10/2; 10/3.

GABROVEC, S. (1964–1965): Halštatska kultura v Sloveniji. *Arheološki vestnik* 15–16, str. 21–63.

GABROVEC, S. (1987): Dolenjska grupa. V/In: *Praistorija Jugoslavenskih zemalja* V, Željezno doba, Sarajevo, str. 29–119.

GABROVEC, S. (1994): *Stična. 1, Naselbinska izkopavanja. Siedlungsausgrabungen.* – Katalogi in monografije 28.

GRAHEK, L. (2004): Halštatska gomila na Hribu v Metliki. *Arheološki vestnik* 55, str. 111–206.

GRAHEK, L. (2016): *Stična. Železnodobna naselbinska keramika/Stična. Iron Age settlement pottery.* Opera Instituti Archaeologici Sloveniae 32.

Guštin, M., in Križ, B. (2007): Lady and her Attire. Reflections of status and Cult in Grave 30/4 from Ivanec near Družinska vas. V/In: *Scripta Praehistorica in Honorem Biba Teržan,* Situla 44, str. 491–505.

HENCKEN, H. (1978): *The Iron Age Cemetery of Magdalenska gora in Slovenia.* American School of Prehistoric Research, Bulletin 32.

HORVAT, M. (1999): *Keramika. Tehnologija keramike, tipologija lončenine, keramični arhiv.* Razprave Filozofske fakultete, Ljubljana.

KNEZ, T. (1986): *Novo mesto. 1, Halštatski grobovi. Hallstattzeitliche Gräber.* – Carniola archaeologica 1.

KNEZ, T. (1993): *Novo mesto* 3. *Kapiteljska njiva. Knežja gomila/Fürstengrabhügel.* Carniola Archaeologica 3.

KOVAČ, O. (2014): Orešje na Bizeljskem. V/In: Teržan, B., Črešnar, M. (ur./eds.), *Absolutno datiranje bronaste in železne dobe na Slovenskem/Absolute dating of the Bronze and Iron Ages in Slovenia.* Katalogi in monografije 40, str. 505–514.

KRIŽ, B. (1981): *Topografija prazgodovinskih naselij v novomeški občini.* Diplomsko delo/Master thesis, Oddelek za arheologijo, Filozofska fakulteta, Univerza v Ljubljani (neobjavljeno/unpublished).

Križ, B. (1982): Brezovica. *Varstvo spomenikov* 24, str. 149.

KRIŽ, B. (1991): Sevno pod Trško goro. *Varstvo spomenikov* 34, str. 297.

KRIŽ, B. (2019): *Novo mesto. Kapiteljska njiva. Način pokopa v starejši železni dobi/Burial rite in the Early Iron Age.* Carniola Archaeologica 8.

LEBEN-SELJAK, P. (2009): Poročilo o antropološki analizi, Mačkovec-Gomila I, 2005. V: UDOVČ, K. *Mačkovec pri Novem mestu.* Zbirka Arheologija na avtocestah Slovenije 8, str. 84. OGRIN, M. (1998): Trortasta fibula v Sloveniji (Die Dreiknopffibel in Slowenien). *Arheološki vestnik* 49, str. 101–132.

OMAHEN, M. (2016): *Bronastodobna naselbina Mačkovec pri Novem mestu: analiza arheoloških ostalin in najdb iz izkopavanj leta 2010 in 2012 s poudarkom na sektorju 2.* Diplomsko delo/Master thesis, Oddelek za arheologijo, Filozofska fakulteta, Univerza v Ljubljani (neobjavljeno/unpublished).

PAVLOVIČ, D. (2007): *Grofove njive pri Drnovem. Halštatskodobna naselbina in gomila.* Diplomsko delo/Master thesis, Oddelek za arheologijo, Filozofska fakulteta, Univerza v Ljubljani (neobjavljeno/unpublished).

PAVLOVIČ, D. (2014): Drnovo. V/In: TERŽAN, Biba (ur.), et al. *Absolutno datiranje bronaste in železne dobe na Slovenskem. Absolute dating of Bronze and Iron Ages in Slovenia.* Katalogi in monografije 40, str. 491–504.

PAVLOVIČ, D. (2018): Gospa z uhani z Grofovih njiv pri Drnovem. Lady with earrings from Grofove njive near Drnovo. V/In: Črešnar, M., Vinazza, M. (ur./eds.) *Srečanja in vplivi v raziskovanju bronaste in železne dobe na Slovenskem: zbornik prispevkov v čast Bibi Teržan*, Ljubljana, str. 353–366.

PLENIČAR, M., PREMRU, U., in HEREK, M. 1976, *Osnovna geološka karta SFRJ* 1 : 100.000, list Novo mesto L 33–79. Geološki zavod Ljubljana, Savezni geološki zavod, Beograd.

STARE, V. (1973): *Prazgodovina Šmarjete. Der vorgeschichtliche Komplex von Šmarjeta.* Katalogi in monografije 10.

SVOLJŠAK, D. (2008): Studenec. V/In: Svoljšak, D., et al., *Mrzlo Polje pri Ivančni Gorici.* Zbirka Arheologija na avtocestah Slovenije 5, str. 82–85.

TECCO HVALA, S. (2007): Women from Magdalenska gora. V/In: *Scripta Praehistorica in Honorem Biba Teržan,* Situla 44, str. 477–490.

TECCO HVALA, S. (2012): *Magdalenska gora. Družbena struktura in grobni rituali železnodobne skupnosti/Social structure and burial rites of the Iron Age community.* Opera Instituti Archaeologici Sloveniae 26.

TECCO HVALA, S. (2014): Kačaste fibule z območja Slovenije (Serpentine fibulae from Slovenia). *Arheološki vestnik* 64, str. 123–184.

TECCO HVALA, S. (2017): *Molnik pri Ljubljani v železni dobi/The Iron Age site at Molnik near Ljubljana.* Opera Instituti Archaeologici Sloveniae 36.

TERŽAN, B. (1974): Halštatske gomile iz Brusnic na Dolenjskem (Die hallstattzeitlichen Grabhügel aus Brusnice bei Novo mesto). V/In: *Varia archaeologica*, Posavski muzej Brežice 1, str. 31–66.

Teržan, B. (1985): Poskus rekonstrukcije halštatske družbene strukture v dolenjskem kulturnem krogu. *Arheološki vestnik* 36, str. 77–122.

TERŽAN, B. (1994a): Überlegungen zum sozialen Status des Handwerkers in der frühen Eisenzeit Südosteuropas. V/In: Dobiat, C., (ur./ed.), *Festschrift für Otto - Herman Frey zum 65. Geburtstag*, Marburger Studien zur Vor- und Frühgeschichte 16, str. 659–669.

Teržan, B. (1994b): 9., 18. in 19. sonda na prečnem nasipu gradišča. V/In: Gabrovec, S., *Stična* I. *Naselbinska izkopavanja/Siedlungsausgrabungen.* Katalogi in monografije 28, str. 120–138.

TERŽAN, B. (2008): Stiške skice (Stična – Skizzen). V/In: TURK, Peter (ur.), et al. *Stična* II/2. *Gomile starejše železne dobe. Razprave (Grabhügel aus der älteren Eisenzeit. Studien*). Katalogi in monografije 38 (2010), str. 189–325.

TERŽAN, B., ČREŠNAR, M. (2014): Poskus absolutnega datiranja starejše železne dobe na Slovenskem/Attempt at an absolute dating of the Early Iron Age in Slovenia. V/In: Teržan, B., Črešnar, M. (ur./eds.), *Absolutno datiranje bronaste in železne dobe na Slovenskem/Absolute dating of the Bronze and Iron Ages in Slovenia*. Katalogi in monografije 40, str. 703–724. UDOVČ, K. (2008): Novo mesto-Gomila Mačkovec. *Varstvo spomenikov* 44, str. 178.

UDOVČ, K. (2009): *Mačkovec pri Novem mestu.* Zbirka Arheologija na avtocestah Slovenije 8. [http://www.zvkds.si/media/images/publications/008_Mackovec_pri_Novem_mestu.pdf].

VOJAKOVIĆ, P., PORENTA, S., TOŠKAN, B. (2014): Novo odkritje prazgodovinske poselitve ob vznožju gradišča Sv. Marjeta na Libni/New discovery of a prehistoric dwelling below the hillfort of Sv. Marjeta on Libna. *Arheološki vestnik* 65, str. 101–121.

Viri

Neobjavljena poročila

LAVRINC, M. (2014): *Poročilo o arheološkem terenskem pregledu v obliki strojno-ročno izkopanih testnih jarkov na parceli št. 217/10, k. o. Ragovo* (hrani arhiv ZVKDS, OE Novo mesto).

MASON, P., PREDAN, P., in BRITOVŠEK, T. (2007): *Poročilo o arheološkem vrednotenju na območju poslovno storitvene cone Mačkovec*, Novo mesto (hrani arhiv ZVKDS, OE Novo mesto).

Mason, P., in Britovšek ,T. (2008): *Poslovno storitvena cona Mačkovec. Poročilo o arheoloških izkopavanjih na območju PSCM 4*, Novo mesto (hrani ZVKDS, OE Novo mesto).

Murko, M. (2010): *Preliminarno poročilo o arheoloških izkopavanjih na arheološkem najdišču PSCM 2010 cona 1a jug* (hrani arhiv ZVKDS, OE Novo mesto).

Murko, M., OMAHEN, M., STRAŠEK, M. (2012a): *Poročilo o arheoloških izkopavanjih na arheološkem najdišču PSC Mačkovec, cona 1a/jug faza 1,2* (hrani arhiv ZVKDS, OE Novo mesto).

Murko, M., OMAHEN, M., STRAŠEK, M. (2012b): *Poročilo o arheoloških izkopavanjih na arheološkem najdišču PSC Mačkovec, cona 1a/jug faza 3* (hrani arhiv ZVKDS, OE Novo mesto).

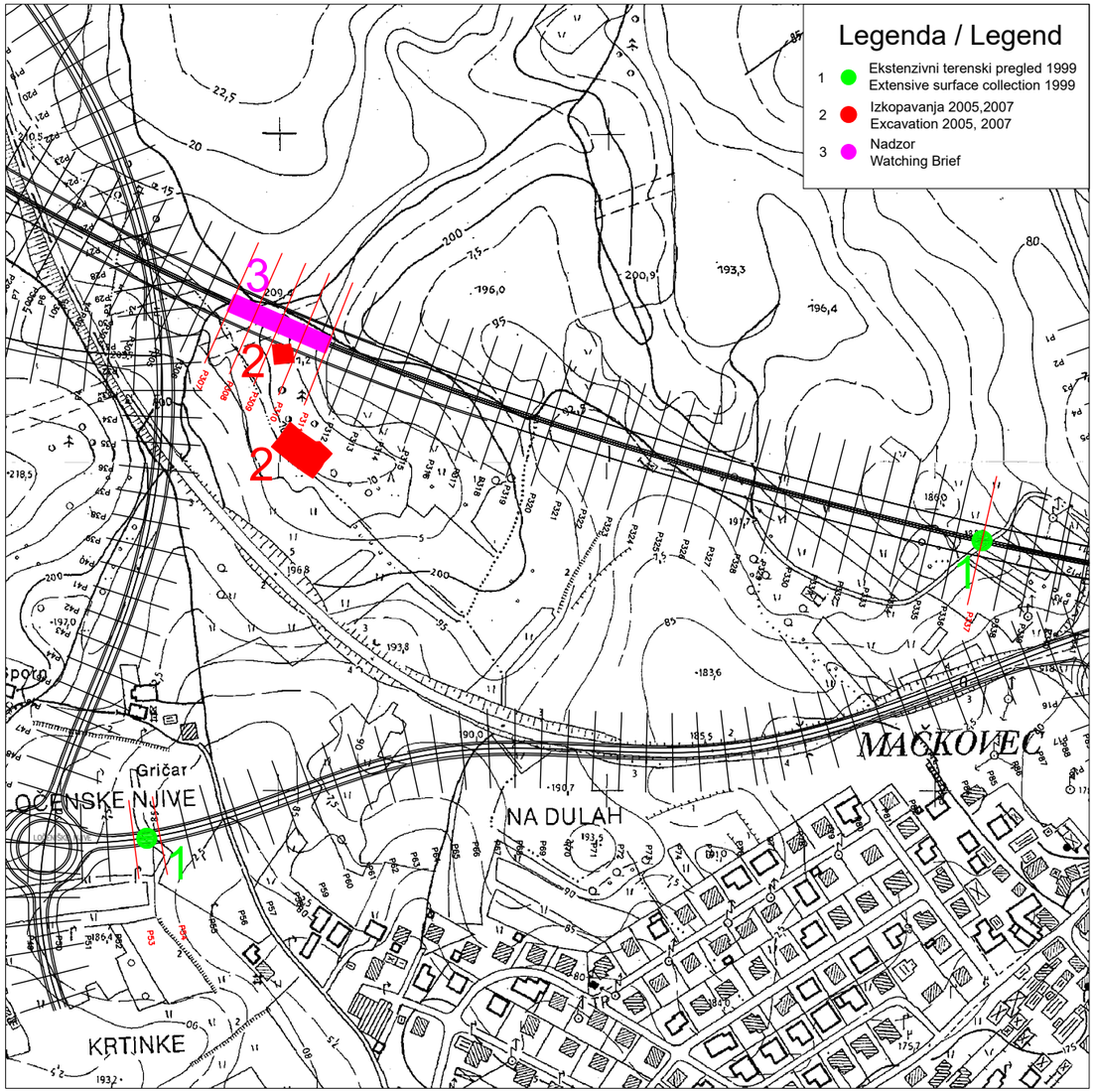
Tica, G. (1999): *Poročilo o rezultatih ekstenzivnega arheološkega pregleda na odseku Hrastje – Kronovo*, Ljubljana (hrani ZVKDS, OE Novo mesto).

PREDAN, P., in BREMEC, R. (2020): *Prvo strokovno poročilo o arheoloških raziskavah za določitev vsebine in sestave najdišč na območju nepremične kulturne dediščine Smolenja vas/Mahovnice (EŠD 3994), Velika Cikava (EŠD 956), Velike njive (EŠD 9447), Žabja vas (EŠD 15640) in Brezovica (EŠD 15643) ter odstranitvi arheoloških ostalin na območju Brezovica (EŠD 9468 in EŠD 15643) pred izgradnjo cestne komunikacije 3. razvojne osi pri Novem mestu* (hrani arhiv ZVKDS, OE Novo mesto).

TIRAN, A. (2017): *Poročilo o arheološkem testnem izkopu v mestnem jedru Novega mesta – 1. faza, parc. št. 1468, 1642, 1641, 1643, 1680 in 1795, vse k. o. Novo mesto* (hrani arhiv ZVKDS, OE Novo mesto).

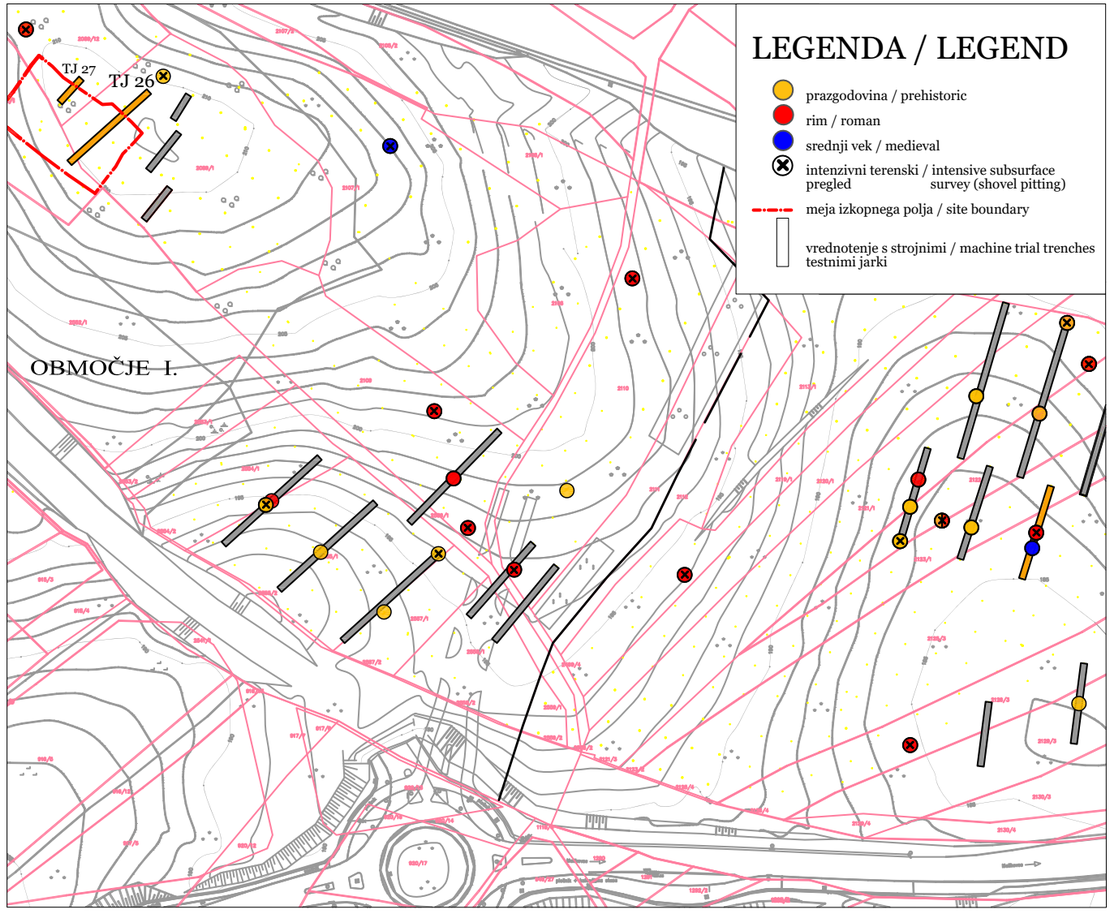
Udovč, K., in Mason, P. (2006): *Poročilo o sistematičnem intenzivnem arheološkem terenskem pregledu na območju poslovno storitvene cone Mačkovec* (hrani arhiv ZVKDS, OE Novo mesto).
Udovč, K. (2007): *Poročilo o arheološkem izkopavanju na lokaciji Poslovno-storitvene cone Mačkovec – PSCM 1*, Novo mesto (hrani arhiv ZVKDS, OE Novo mesto).

1. Lega arheološkega najdišča Mačkovec pri Novem mestu – PSCM 1 (vir: ©GURS).
1. Position of Mačkovec near Novo Mesto – PSCM 1 archaeological site (source: ©GURS).



2. Mačkovec pri Novem mestu. Območja in vrsta arheoloških raziskav v letih 1999, 2005 in 2007 (izdelal D. Cvetko, ZVKDS, CPA; podlaga TTN5 lista G222700.tif, G223700.tif; ©GURS).

2. Mačkovec near Novo Mesto. Areas and type of archaeological investigations in 1999, 2005 and 2007 (prepared by D. Cvetko, ZVKDS, CPA; base TTN5, pages G222700.tif, G223700.tif; ©GURS).

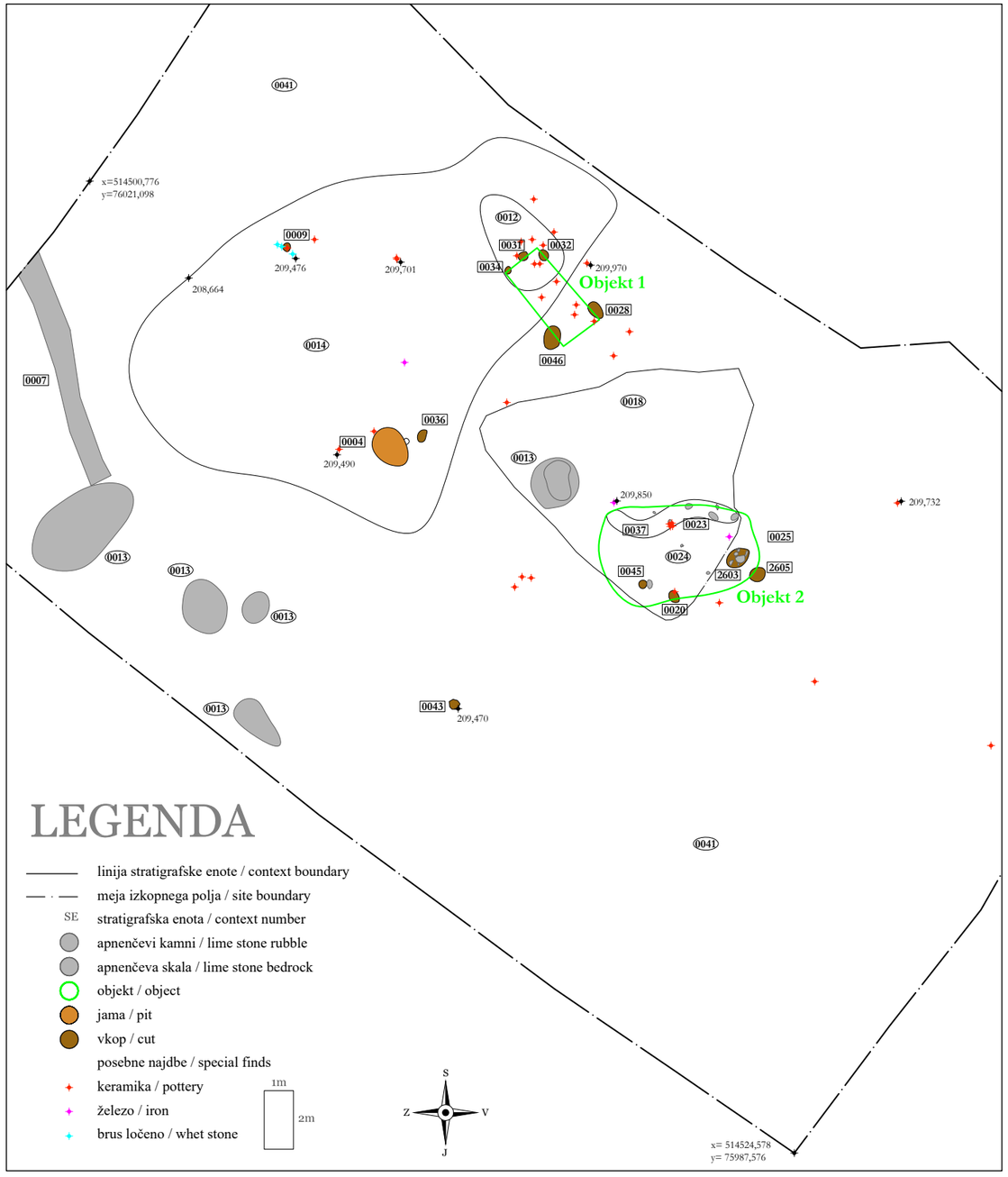


3. Mačkovec pri Novem mestu. Rezultati intenzivnega terenskega pregleda in vrednotenja s testnimi strojnimi jarki. Vrisane so lokacije najdb iz različnih arheoloških obdobij (izdelala: F. Aš, ZVKDS, OE Novo mesto in D. Cvetko, ZVKDS, CPA; podlaga TTN5, lista G222700.tif, G223700.tif; ©GURS).

3. Mačkovec near Novo Mesto. Results of intensive field survey and evaluations using mechanically dug trial trenches. The locations of finds from different archaeological periods are drawn in (prepared by: F. Aš, ZVKDS, Novo Mesto Regional Unit and D. Cvetko, ZVKDS, CPA; base TTN5, pages G222700.tif, G223700.tif; ©GURS).

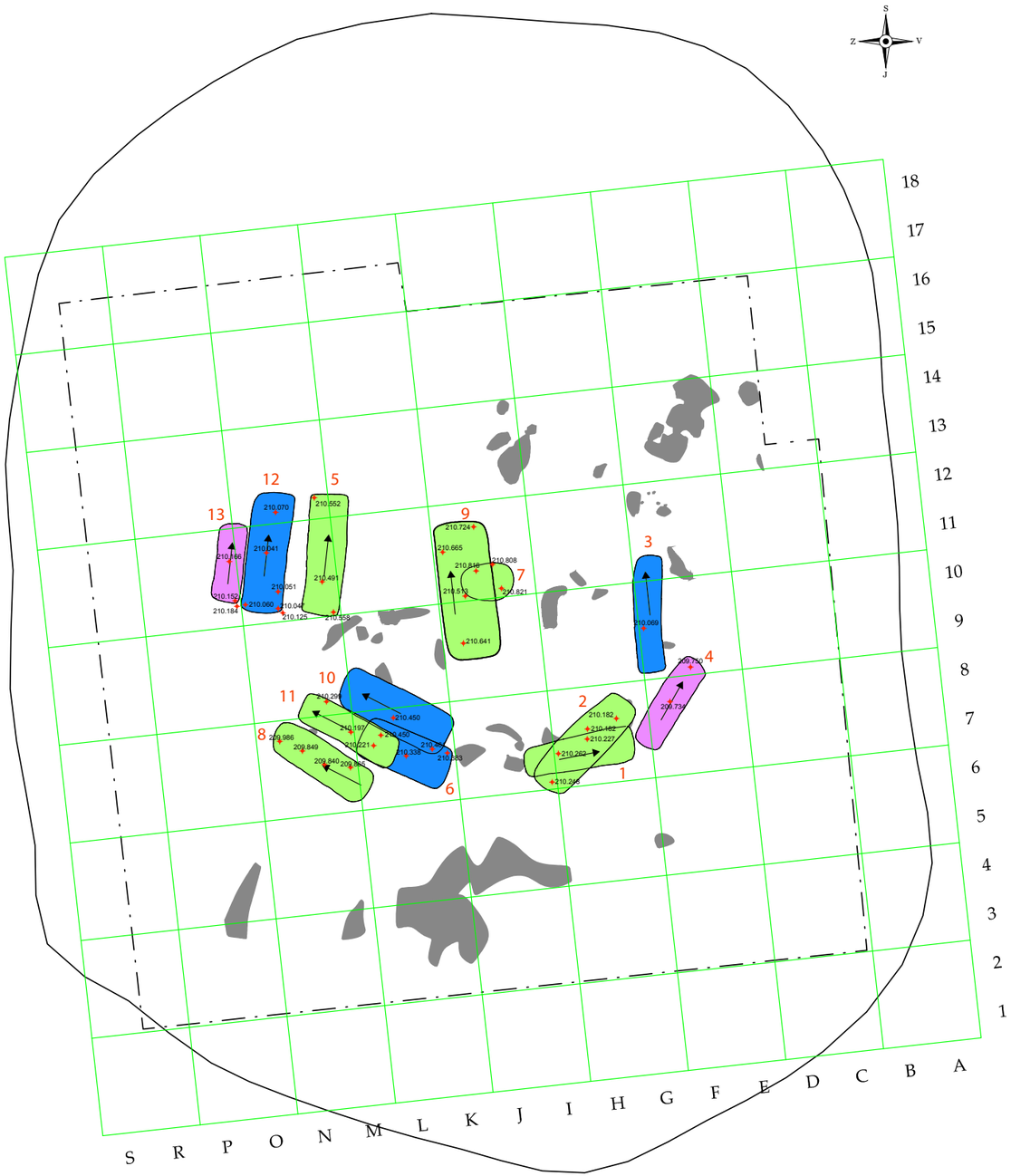
4. Mačkovec pri Novem mestu. Pogled iz zraka na raziskana območja: 1 – naselbina iz starejše železne dobe; 2 – prazgodovinski vkop in srednjeveška jama; 3–6 – naselbina iz srednje bronaste dobe; 4 – gomili iz starejše železne dobe in grobišče iz rimske dobe; 6 – grobovi, jarki, peč, cesta iz rimske dobe; 7 – območje s prazgodovinsko keramiko (foto: M. Pršina, hrani: arhiv ZVKDS, OE Novo mesto).
4. Mačkovec near Novo Mesto. Aerial view of investigated areas: 1 – Early Iron Age settlement; 2 – prehistoric cut and medieval pit; 3–6 – Middle Bronze Age settlement; 4 – Early Iron Age tumuli and Roman-era burial ground; 6 – Roman-era graves, ditches, oven, road; 7 – area with prehistoric pottery (photo: M. Pršina, kept by: ZVKDS Novo Mesto Regional Unit archives).

5. Sledi naselbine PSCM1 iz starejše železne dobe z odlomki prazgodovinske keramike in kamnitih žrmlj (foto: M. Pungerčar, hrani: arhiv ZVKDS, OE Novo mesto).
5. Traces of Early Iron Age settlement PSCM1 with fragments of prehistoric pottery and stone hand-mills (photo: M. Pungerčar, kept by: ZVKDS Novo Mesto Regional Unit archives).



6. Mačkovec pri Novem mestu, območje PSCM 1. Tloris naselbine z objektoma, vkopi in lego posebnih najdb iz starejše železne dobe (izdelal: D. Cvetko, ZVKDS, CPA).
6. Mačkovec near Novo Mesto, area PSCM 1. Ground plan of settlement with two structures, cuts and position of special finds from the Early Iron Age (drawn by: D. Cvetko, ZVKDS, CPA).

7. Mačkovec pri Novem mestu, zahodni profil gomile iz leta 2005. Gomilo so nasuli na preperelo apnenčevo skalo (foto: B. Križ, Dolenjski muzej).
7. Mačkovec near Novo Mesto, western profile of the tumulus from 2005. The mantle of the tumulus was laid over weathered calcareous rock (photo: B. Križ, Dolenjska Museum).

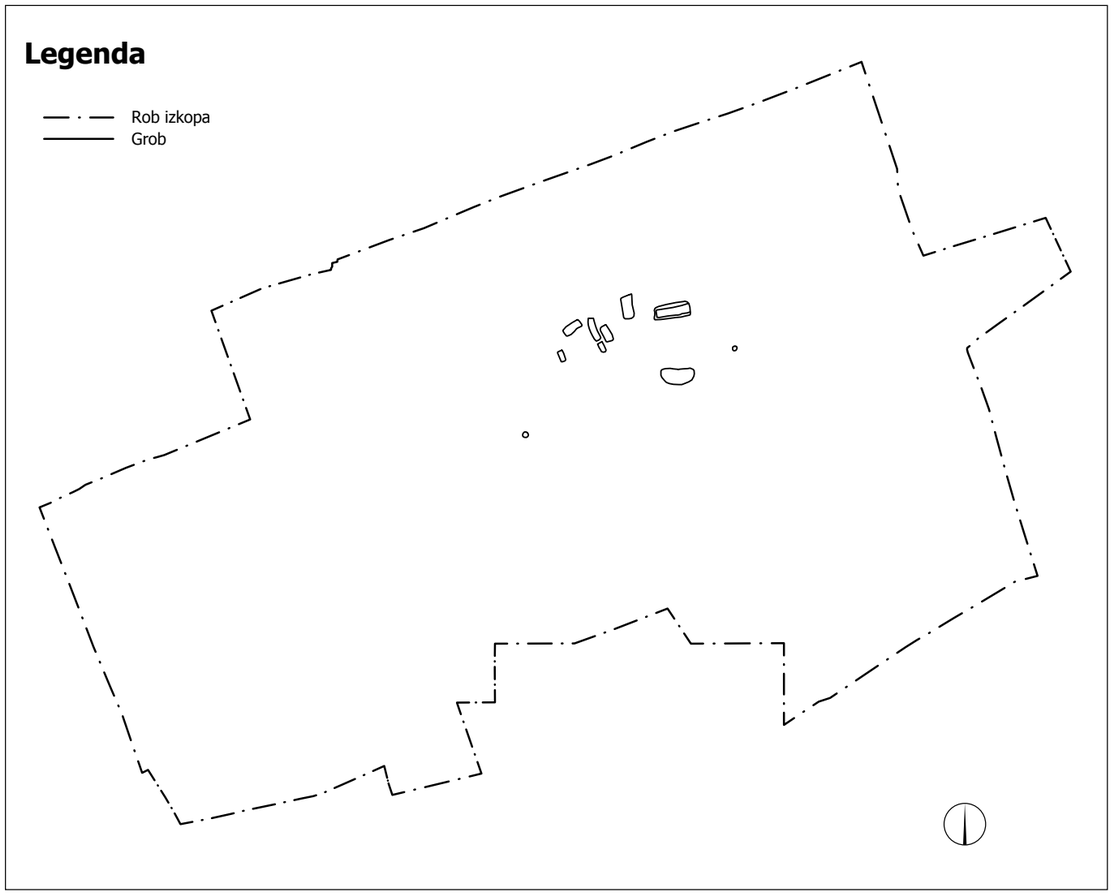


8. Mačkovec pri Novem mestu, gomila I/2005. Struktura grobov glede na spol in smer pokopa (izdelala: F. Aš, ZVKDS, OE Novo mesto, in D. Cvetko, ZVKDS, CPA).
8. Mačkovec near Novo Mesto, Tumulus I/2005. Structure of graves by gender and direction of burial (prepared by: F. Aš, ZVKDS, Novo Mesto Regional Unit and D. Cvetko, ZVKDS, CPA).

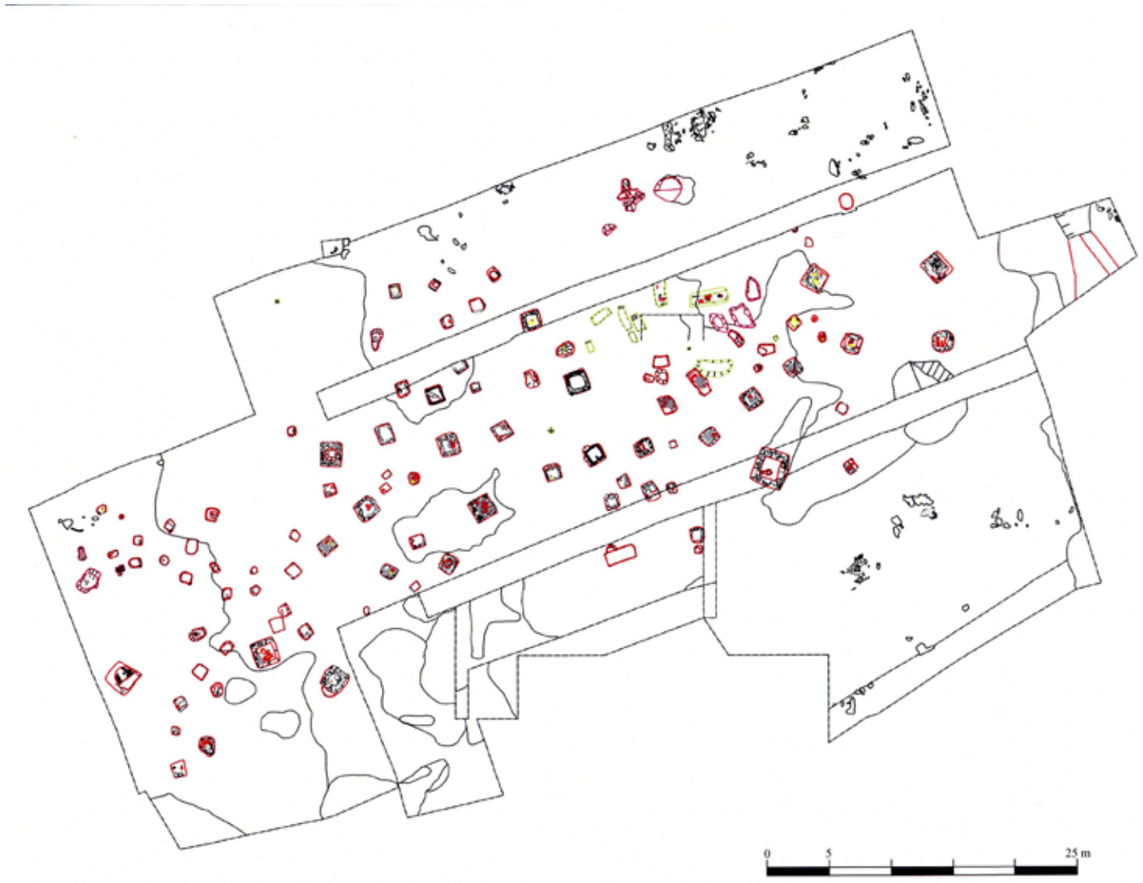
grob / grave	Jantarne jagode / Amber beads	Steklene jagode / Glass beads	Zapestnice / Bracelets	Lasni-obsenčni obročki/ Hairrings	Scepter / Scepter	Nanožnice / Anklets	Fibule / Fibulae				Sulici / Spears	Sekira / Axe	Noži / Knifes	Šilo / Awl
							certoške / certosa	kačaste / serpentine	trortaste / three-knobbed	cert. samostrelna/ certosa crossbow				
1		1				2								
2	9	7												
3											1	1	1	1
4														
5	85		2			2								
6	4	1								4			1	1
7														
8	4	87	4		1				1					
9	60			2				1						
10	2						1	1					2	
11	18					2								
12											1			1
13		35												
izven / out														
	182	131	6	2	1	6	1	2	1	4	2	1	4	3

grob / grave	Železna igla / Iron pin	Brus / Whetstone	Odbitek / Stone flake	Bronasti predmeti / Bronze finds	Pasne spone / Belts	Ciboriji / Footed lidded bowls	Vretenca / Spindle whorls	Sklede na nogi / Footed bowls	Sklede / Bowls	Skodele / Small bowls	Čaša/ Beaker	Lonci / Jars	Latvice / Dishes	nedoločljivo / indeterminate
1						2	1							
2									1					
3					1	1								
4												1		
5	1			2		1	1				1		1	
6		1												
7						2	1		1	1	1		1	
8							1							1
9			1									1	1	
10					1	2			1					
11							1		1					
12					1							1	1	
13								1						
izven / out			1				1						2	
	1	1	2	2	3	8	6	1	4	1	2	3	6	1

9. Mačkovec pri Novem mestu, gomila I/2005. Struktura najdb v grobovih (izdelala: K. Udovč, ZVKDS, CPA).
9. Mačkovec near Novo Mesto, Tumulus I/2005. Structure of finds in graves (prepared by: K. Udovč, ZVKDS, CPA).

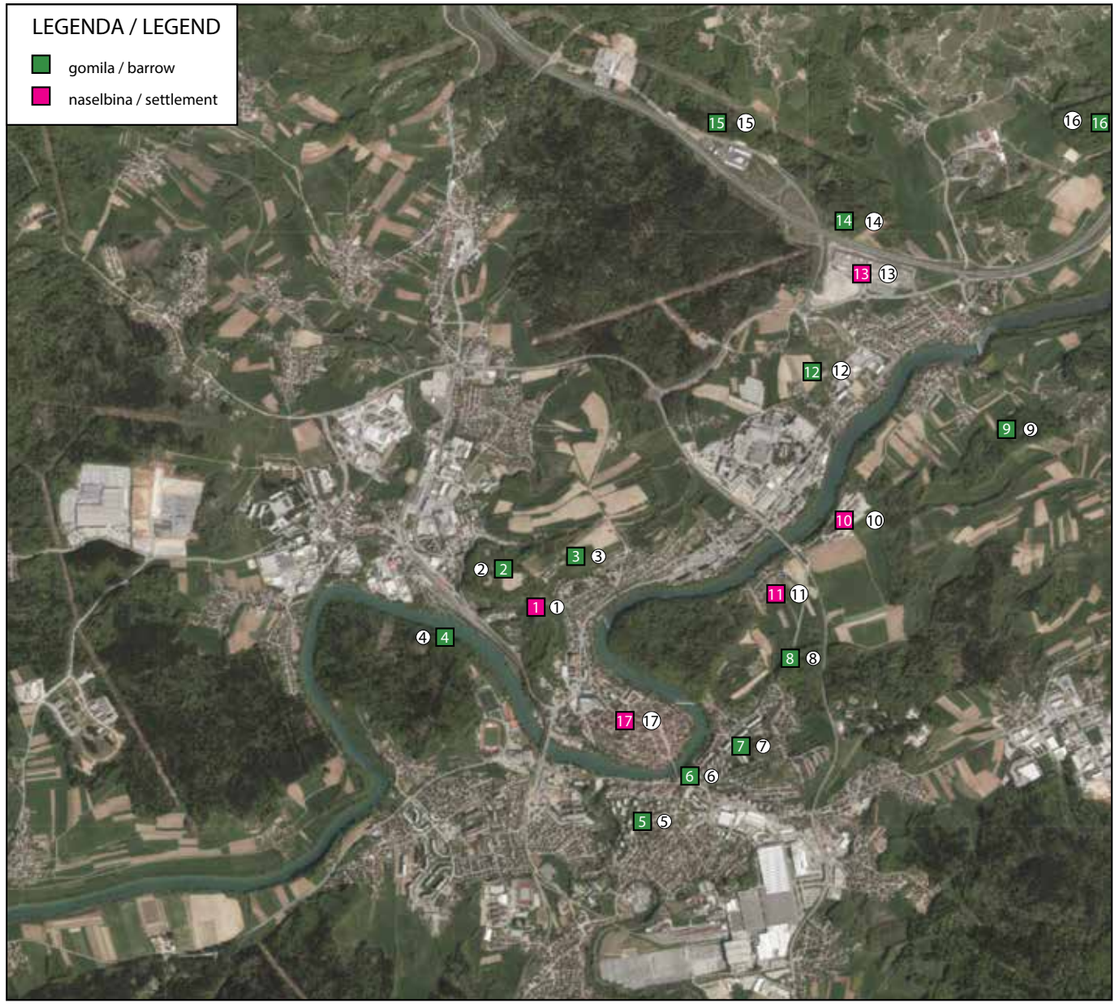


10a. Mačkovec pri Novem mestu, območje PSCM 4. Tloris gomil iz starejše železne dobe (izdelala: P. Mason in D. Cvetko, ZVKDS, CPA).
10a. Mačkovec near Novo Mesto, area PSCM 4. Ground plan of Early Iron Age tumuli (drawn by: P. Mason and D. Cvetko, ZVKDS, CPA).



10b. Mačkovec pri Novem mestu, območje PSCM 4. Tloris gomil iz starejše železne dobe (izdelala: P. Mason in D. Cvetko, ZVKDS, CPA).
10b. Mačkovec near Novo Mesto, area PSCM 4. Ground plan of Early Iron Age tumuli (drawn by: P. Mason and D. Cvetko, ZVKDS, CPA).

11. Mačkovec pri Novem mestu, območje PSCM 4. Najbogatejši grob s pridatki (foto: A. Tiran, hrani arhiv ZVKDS, CPA).
11. Mačkovec near Novo Mesto, area PSCM 4. The richest grave with grave goods (photo: A. Tiran, kept by: ZVKDS, CPA archives).



12. Arheološka najdišča iz starejše železne dobe v Novem mestu in okolici: 1 – Marof; 2 – Kapiteljska njiva; 3 – Mestne njive; 4 – Portoval; 5 – Kandija; 6 – Zagrebška cesta; 7 – Malenškova njiva; 8 – Smolova hosta; 9 – Smolenja vas; 10 – Graben; 11 – Ragovo; 12 – Mačkovec pri Novem mestu: gomila PSCM 4; 13 – Mačkovec pri Novem mestu: naselbina PSCM 1; 14 – Mačkovec pri Novem mestu: gomila I/2005; 15 – Brezovica; 16 – Jakovec; 17 – novomeški okljuk (izdelal D. Cvetko, ZVKDS, CPA; vir: podlaga DOF, listi G0426, G0427, G0428, G03436, G03437, G0446, G0447; ©GURS).

12. Early Iron Age archaeological sites in Novo Mesto and the surrounding area: 1 – Marof; 2 – Kapiteljska Njiva; 3 – Mestne Njive; 4 – Portoval; 5 – Kandija; 6 – Zagrebška Cesta; 7 – Malenškova Njiva; 8 – Smolova Hosta; 9 – Smolenja Vas; 10 – Graben; 11 – Ragovo; 12 – Mačkovec near Novo Mesto: tumulus PSCM 4; 13 – Mačkovec near Novo Mesto: settlement PSCM 1; 14 – Mačkovec near Novo Mesto: Tumulus I/2005; 15 – Brezovica; 16 – Jakovec; 17 – Novo Mesto river bend (prepared by D. Cvetko, ZVKDS, CPA; source: base DOF, pages G0426, G0427, G0428, G03436, G03437, G0446, G0447; ©GURS).

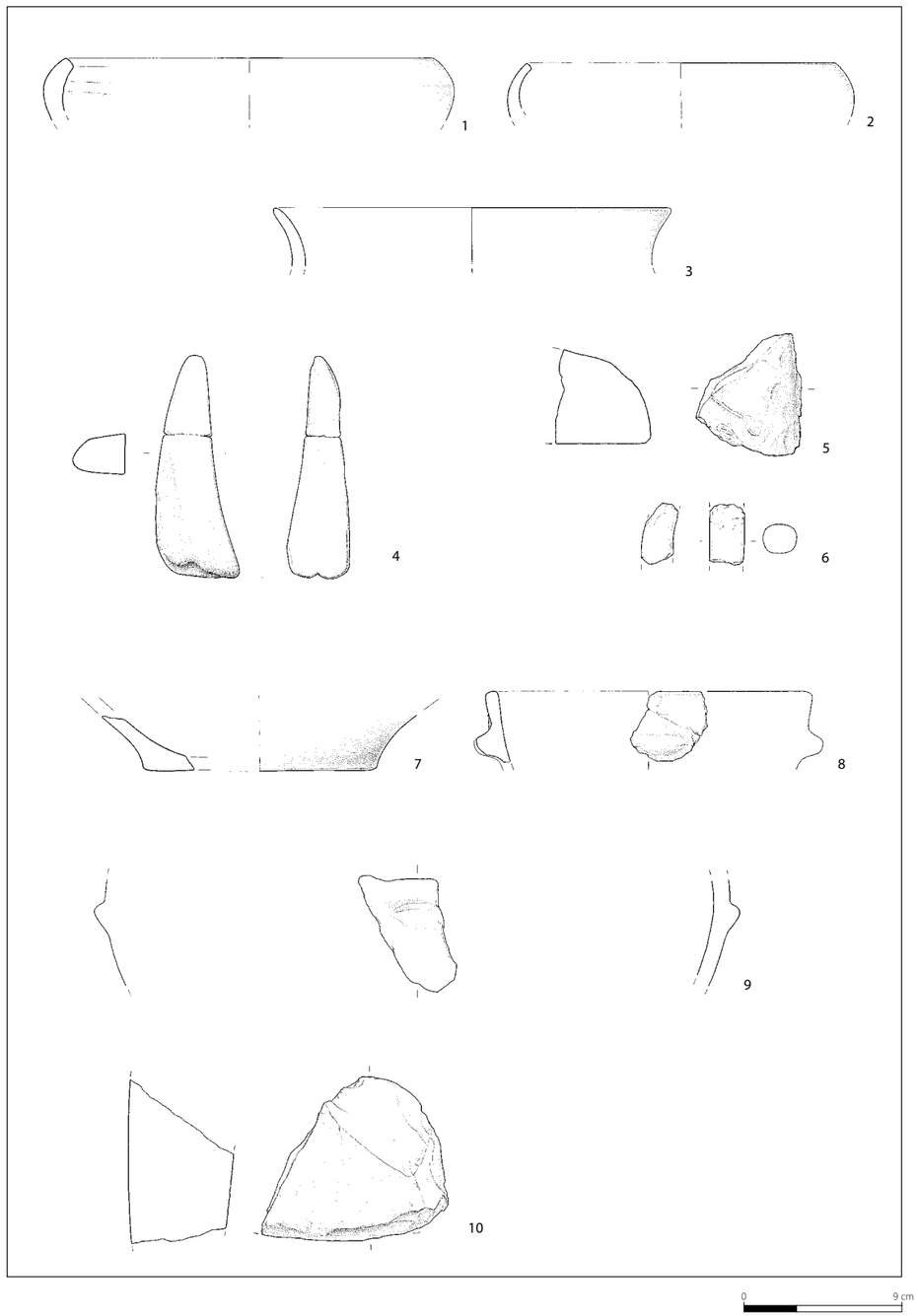


Tabla 1. Mačkovec pri Novem mestu. Najdbe, odkrite pri arheološkem nadzoru na območju 1 (1–3) in v naselbinskih plasteh PSCM 1: SE 008 (4–6) in SE 012 (7–10). 4, 5, 10– kamen; ostalo keramika (risbe predmetov: A. Fortuna Saje, ZVKDS CPA).

Plate 1. Mačkovec pri Novem mestu: Finds from the archaeological watching brief on area 1 (1–3) and excavated in occupation layers PSCM 1: SE 008 (4–6) in SE 012 (7–10). 4, 5, 10– stone; other pottery (drawings: A. Fortuna Saje, ZVKDS CPA).

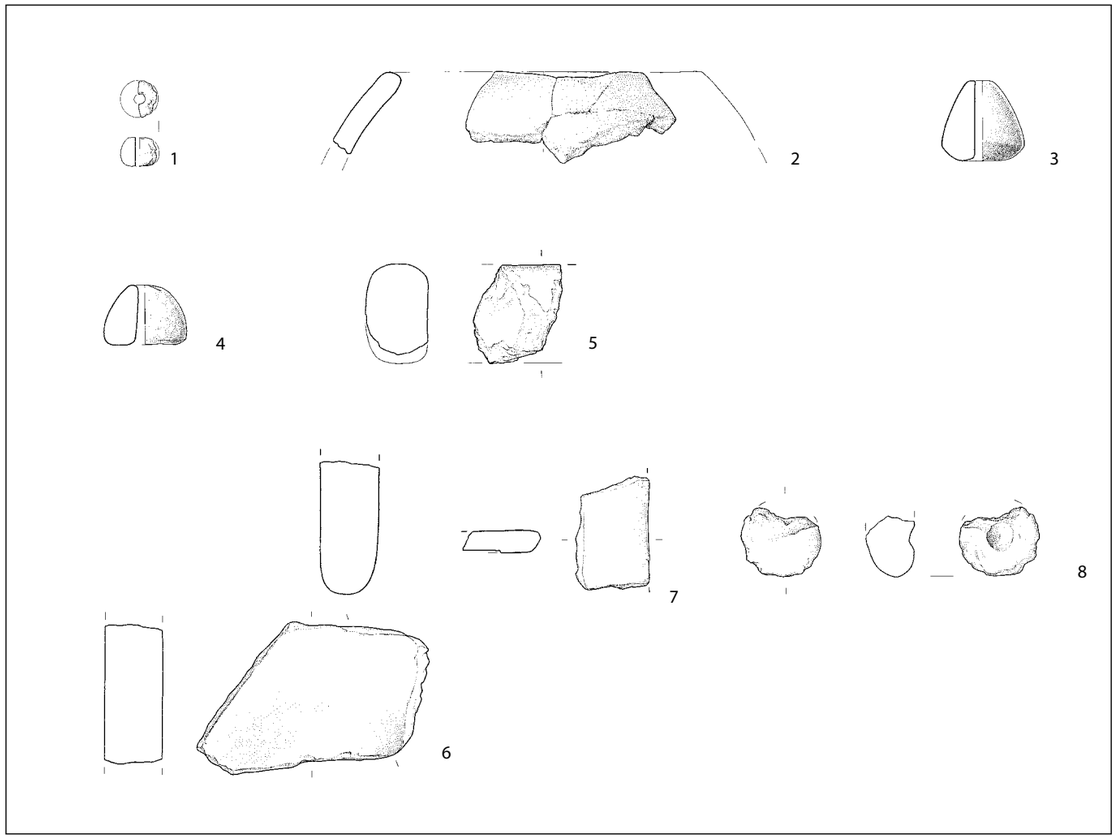


Tabla 2. Mačkovec pri Novem mestu. Najdbe, izkopane na območju PSCM 1 v plasteh SE 014 (1–3); SE 018 (4–5); SE 024 – objekt 2 (6–8). 6, 7– kamen; 1– steklena jagoda; ostalo keramika (risbe predmetov: A. Fortuna Saje, ZVKDS CPA).
Plate 2. Mačkovec pri Novem mestu. Finds excavated on area PSCM 1 in layers SE 014 (1–3); SE 018 (4–5); SE 024 – object 2 (6–8). 6, 7– stone; 1– glass bead; other pottery (drawings: A. Fortuna Saje, ZVKDS CPA).

Katarina Udovč

Early Iron Age lowland settlement at Mačkovec near Novo Mesto

Professional article
COBISS 1.04

UDC
902/904(497.4Novo mesto)
903.4(497.4Novo mesto)

Keywords: Dolenjska, Novo Mesto – Mačkovec, preliminary investigations, Early Iron Age, Dolenjska Hallstatt group, lowland settlement, tumuli

Abstract

The Mačkovec archaeological area near Novo Mesto was discovered in the course of preliminary investigations along the route of the planned motorway and in an area designated as a business and service zone in, respectively, 1999 and 2006. The investigations included all methods ranging from an extensive field survey to archaeological excavations. The area now designated as an archaeological area combines several locations of different types and with different names dating from a period that runs from prehistory to the Late Middle Ages. This article presents one of the rare Early Iron Age lowland settlements in the area of the Dolenjska Hallstatt group. We excavated two tumuli in the vicinity of the settlement. We will compare the rich Mačkovec tumulus, findings from which have already been published, with the tumuli at the Kapiteljska Njiva site and in the area around Magdalenska Gora. We will evaluate and supplement the typology of elements of female and male costume. Pottery stands out among the finds for its rarity. As many as eight differently decorated footed bowls were excavated from a tumulus containing 13 graves. Through a comparison of the grave inventory, we aim to prove that this was not an insignificant hamlet, even though only modest traces of it have survived to the present day. The central grave of the Mačkovec tumulus was that of a woman, while Grave 8 contained a priestess, which raises questions as to the purpose or function of the settlement.

According to our present knowledge, the Early Iron Age inhabitants of the Dolenjska region lived for the most part in fortified settlements on hilltops – known as hillforts. Very few settlements are known outside these hillforts (Dular, Tecco Hvala, 2007: 145; Dular, 2020: 403). One rare example has been discovered at Mačkovec (*Fig. 1*), around 2,600 metres as the crow flies from the important archaeological complex in Novo Mesto. The latter consists of a hillfort on Marof, flat graves from the Late Iron Age and Late Bronze Age, and Early Iron Age tumulus necropolises.1 No finds are known of in the area around Mačkovec before 1999 with the exception of a milestone from the reign of Septimius Severus. A find consisting of a Hallstatt bracelet and three Roman gold coins from Trška Gora is mentioned, while the archaeologist Jernej Pečnik believed Bajnof to be a site of prehistoric antiquities (Ansl, 1975: 233). To the west of Mačkovec, along the local road running in the direction of Ždinja Vas, an as yet unresearched tumulus with a diameter of 30 metres and an extant height of up to three metres is located in the Brezovica wood (Križ, 1982: 149). The archaeological picture of the area was complemented by preliminary investigations on the route of the present-day motorway in 1999 and in the area of the business and service zone in 2006. Traces of settlement from the Bronze Age, the Early Iron Age and the Roman era (*Fig. 3*) have been found

1 Older literature is mentioned in Križ, 2019.

Katarina Udovč, Institute for the Protection of Cultural Heritage of Slovenia, katarina.udovc@zvkds.si

outside the densely built area in farmland and woodland between Mačkovec and the foot of Trška Gora (*Fig. 2*). Below we present the northernmost and highest-lying location in which the remains of an unfortified lowland settlement and at least two tumuli, one containing thirteen graves and the other with three burials, have been found. Finds were excavated in all thirteen graves of the first tumulus and in two of the second. We have named the archaeological sites "Mačkovec Tumulus – Tumulus Mound I"[2] and "Mačkovec Business and Service Zone" or, respectively, PSCM 1 and PSCM 4 (Udovč, 2008: 178).

Mačkovec archaeological area

Extensive field surveys carried out in 1999 along the route of the planned motorway past Mačkovec unearthed fragments of prehistoric pottery (*Fig. 2: 1*), that pointed to a new archaeological site (Tica, 1999).[3] In 2005 we documented and excavated 13 graves in a tumulus that was set to be destroyed by the construction of the motorway (*Fig. 2: 2*) (Udovč, 2009: 5). During regulation of the embankment, following the completion of excavations, we conducted an archaeological inspection along the route of the motorway and came across fragments of pottery (*Fig. 2: 3*). Among them, we were able to identify two shallow dishes with inturned rims and a jar (*Plate 1: 1–3*). In 2006 intensive field surveys were carried out of the area of the Mačkovec business and service zone, bounded by the motorway, the local road and the slope towards Ločna. Fragments of pottery from prehistoric, Roman and later periods were unearthed at several points (*Fig. 3*) (Udovč, 2006). This phase was followed by evaluations of archaeological potential using mechanically dug trenches (Mason, Predan, Britovšek, 2007). Archaeological excavations were carried out in areas with a greater density of finds.[4]

We divided the Mačkovec archaeological area into several sites, taking into account past and present roads and tracks (*Fig. 4*). In the area designated PSCM 1 we found traces of an Early Iron Age settlement (*Fig. 4: 1*). In PSCM 2 we found a prehistoric cut and a medieval pit (*Fig. 4: 2*). In area 5[5] (*Fig. 4: 5*) we came across traces of habitation dating from the Middle Bronze Age, while in terms of culture the finds can be defined as belonging to the Virovitica group. We also found the remains of Middle Bronze Age habitation in the area to the south of the local road, which we designated PSCM 3 (*Fig. 4: 3*). A tumulus containing two Early Iron Age inhumation graves and a Roman burial site with 89 graves dating from the first and second centuries AD were investigated in the PSCM 4 area (*Fig. 4: 4*) (Mason, Britovšek, 2008). Structures or postholes, pits, hearths and pottery dating from the Bronze Age and a further 17 graves, ditches, a limestone quarry and a bread oven from the Roman era were discovered in 2010 between PSCM 3 and PSCM 4 (*Fig. 4: 6*). A Roman road was also found at the southern foot of the Krtinke knoll (*Fig. 4: 6*) (Murko, 2010; Murko, Omahen, Strašek, 2012; Omahen, 2016). Further investigations were carried out in 2020 in the Ločenske Njive area, i.e. on the route of the third development axis (*Fig. 4: 7*). Fragments of prehistoric pottery were unearthed, but no structures were found (Predan and Bremec, 2020: 150). The archaeological sites lie in an area of covered karst. The geological substrate consists of white to grey limestone, oolitic limestone, reef limestone with hydrozoa, brown clay eluvium and terra rossa.[6]

Settlement remains at Mačkovec

The area of the investigations lay on a prominence at a height of 210 metres above sea level (*Figs 2; 3; 4: 1*). commanding a good view over the plain by the river Krka. Excavations took place on abandoned arable land overgrown with trees and shrubs. Today the area lies within the Ljubljana–Obrežje section of motorway and the local Novo Mesto–Otočec road. A shopping centre has been built in the investigated area.

We carried out archaeological investigations using the stratigraphic method in an area measuring 23.5 x 40 m, which included mechanically dug Trenches 26 and 27 (*Fig. 3*). The excavations took place during a dry spell in July 2007, which made identifying remains more difficult. The presence of roots also made the process more difficult. We removed the upper layers (turf and topsoil) mechanically. Pottery began to appear at a depth of 0.30 m (*Fig. 5*). We then proceeded with manual digging until we reached a "sterile" loam base at a depth of 0.45 m below the surface. We encountered a large number of potsherds in the western and central parts of the excavation. We designated clusters of pottery, spindle whorls, whetstones and iron artefacts as special finds (*Fig. 6*). In total we documented 57 stratigraphic units, although we eliminated some during post-dig processing of data because it turned out that their darker colouring was a consequence of the weathering of roots or the geological base.

Weathered calcareous rock appeared in bands at a depth of 0.20 m in the SW part of the dig (SU 013). Elsewhere the geological base consisted of a loamy stratum (SU 041). It was covered by three cultural layers of identical consistency and colour (SU 012, 014 in 018), distinguished by different concentrations of pottery, iron ore and house daub.

Iron ore was found in addition to potsherds, house daub and burnt clay in layer SU 012 in the NE part of the excavation. Five post-pits were cut into this layer, indicating the rectangular ground plan of a building (**Structure 1**) measuring 3 x 2.5 m and a NW–SU orientation (*Fig. 6*). The eastern post-pit (SU 028), measuring 0.55 x 0.44 m, and the southern post-pit (SU 046), widened from its original 0.40 m diameter to 0.80 x 0.95 m because of a root, stood out in terms of size. Three post-pits (SU 034, 032, 031) of circular plan and with an average diameter of 0.35 m indicated the NW side of the building. Their depth was between 0.09 and 0.12 m (*Fig. 6*).

Seven metres to the south-east of Structure 1, **Structure 2** (SU 025, SU 024 and SU 023) was embedded in SU 018 (*Fig. 6*). In terms of plan it has a rectangular shape with rounded corners. It measured 5.5 x 3.5 m and had a W–E orientation. Its northern side was better preserved. On its eastern side it had been damaged by Trial Trench 26 (*Fig. 3*). A sequence of flat calcareous stones was found running from west to east (SU 023). They were lying in SU 037. Their length varies from 0.24 to 0.44 m and their width from 0.24 to 0.21 m. We interpreted them as stone foundations for a wooden superstructure. A dark brown stratum running along the line of stones (SU 037) contained fragments of daub and, above all, particles of charcoal.[7] In the southern part of the structure two pits (SU 045 and SU 020), probably post-pits, were cut through SU 024 into SU 041. Two calcareous stones measuring 0.15 x 0.10 m that lay perpendicular to the line with the foundation (SU 023) probably also belonged to the structure. A cut (SU 045) that complemented the southern line of the foundation was filled with two stones measuring 0.15 x 0.10 m and silty brown loam. Cuts SU 2603 and SU 2605, which are part of Structure 2, were documented in Trial Trench 26. Initially both SU 2603 and SU 2605 were interpreted as postholes but it became apparent during the course of excavations that SU 2603 was part of the surviving foundations. Even more flat stones lay in the vicinity, so we therefore assume that Structure 2 was damaged by agricultural activity in the modern era.

The interior of the structure was filled with greasy loam (SU 024) of a light greenish or yellowish brown colour (2.5YR 6/4). Its colour and consistency are in all likelihood the consequence of the weathering of wood, since traces of wooden coffins in the tumuli at the Kapiteljska Njiva site in Novo Mesto have been preserved in a similar form (Križ, 2019: 48). The interior of Structure 2 contained three highly corroded unidentifiable iron objects, a spindle whorl, large pieces of daub with impressions of branches, charcoal particles and potsherds. We did not succeed in assembling a single whole pot from the fragments of reduction-fired and oxidation-fired pottery. Judging from the weight or friability of the pottery and daub and a melted glass bead, we assume that the settlement was either destroyed in a fire or that there was a fire in this area after the settlement had been abandoned.

Analysis of the data allowed us to identify two structures built using different techniques and with different orientations. We found large pieces of house daub with impressions of branches in the interiors of both structures, while outside them we only found fragments. No animal bones or hearths were found in the area investigated.

Three post-pits and four smaller postholes (*Fig. 6*) were discovered outside the structures in the area investigated. The postholes (SU 009, SU 036, SU 043 and SU 2605) were oval in plan with an average depth of 0.10 m. SU 009 and SU 036 were cut in SU 014 and packed with brown silty loam. Silty loam packed SU 043 and SU 2605, which were cut into a loamy geological base. In the western part of the area, we documented three larger pits (SU 004, SU 2706 and SU 2708) in SU 014/SU 012. Pits SU 2706 and SU 2708 were documented during excavation of the mechanically excavated Trench 27 and a part of Structure 1. They were packed with silty loam, particles of burnt clay and fragments of prehistoric pottery, while the packing designated SU 005, which filled SU 004, was without finds.

Finds

As regards the category of storage containers, kitchenware and serving dishes, we excavated fragments of a pithos, pots, bowls and the handle of a baking cover. The shapes of kitchenware did not change frequently over the course of history and we did not dig up any metal artefacts, which are chronologically more narrowly definable. In our attempt at dating the finds, we relied on Lucija Grahek's typological-chronological definition, which is based on ceramics from the settlement layers of a hillfort in Stična (Grahek, 2016).

A jar with an inturned rim (*Plate 2: 2*) can be classed as Type L1 under Grahek's classification. At Stična the largest number of vessels of this type were found in the layers along Wall I, dated to the Podzemelj and Stična 1 phases, although they still appear in layers from the La Tène period (Grahek, 2016: 112, Fig. 53). A similar jar was found in House B at Kučar (Dular and Ciglenečki, 1995: Plate 15: 3–4). A pithos fragment with a knob (*Plate 1: 9*) was classified as belonging to Type Pi1b. Pithoi of Type Pi1 are present at Stična in all Hallstatt layers and also La Tène layers, although they are most commonly found in the layers associated with Wall I and Wall II, in other words from the Podzemelj phase to the Serpentine Fibulae and Certosa Fibulae phase (Grahek, 2016: 109, Fig. 37). A dish with a slightly everted and extended funnel-shaped rim (*Plate 1: 8*) was classified

2 Findings on the tumulus have already been published in full (Udovč, 2009).

3 Phil Mason, conservator from the Novo Mesto Regional Unit of the Institute for the Protection of Cultural Heritage of Slovenia (ZVKDS), secured the locations as Novo Mesto – Brezovica Archaeological Site (EŠD [unique heritage number] 15644) and Novo Nesto – Lopata nad Mačkovcem Archaeological Site (EŠD 15643).

4 Until 2008 the excavations were carried out by ZVKDS; after 2010 they were carried out by PJP under the conservation supervision of Uroš Bavec and Tina Britovšek (ZVKDS, Novo Mesto Regional Unit).

5 For this publication we combined sites PSCM 5–9 into this area.

6 Basic geological map and key, Novo Mesto page, 1977.

7 Charcoal samples were not taken because of fragmentation.

as Type Sk11. Dishes of this kind are rare among the Stična pottery but were found in the layers associated with Wall III and dated to the Late Hallstatt period (Grahek, 2016: 161–162, 238–239, Fig. 47). A similar dish was dug up at Libna in a layer also containing an indented bowl, which confirms this dating (Vojaković, 2014: 107, Plate 2: 9, 107).

In addition to potsherds weighing a total of 5 kg, finds included whetstones (*Plate 1: 4; 2: 7, 8*), spindle whorls (*Plate 2: 4, 5, 9*), three unidentifiable iron fragments, fragments of stone hand-mills (*Plate 1: 5; 2: 1*), a disc-shaped bead made of blue glass (*Plate 2: 3*) and the handle of a baking cover (*Plate 2: 6*). Whetstones and spindle whorls were also placed in graves in Dolenjska in the Hallstatt period as a sign indicating craftsmen (Teržan, 1999a), while fragments of hand-mills are common settlement finds in a general sense. We chronologically defined settlement remains as belonging to the Early Iron Age on the basis of the fragments of iron artefacts discovered and the method of construction. Post-pad construction is believed to have been the predominant construction method in the Early Iron Age, and this was the method used to construct buildings in hillforts (Dular, Tecco Hvala, 2007: 122; Dular, 2008: 340). We assume that this was the method used to construct Structure 2. Given the presence of a dish with a funnel-shaped rim (*Plate 1: 8*), habitation in this area could be more precisely dated to the Late Hallstatt period or the Serpentine Fibulae and Certosa Fibulae phases. This dating is also indicated by finds from the nearby Tumulus I at Mačkovec, from which we excavated similar spindle whorls, whetstones and blue glass beads (*Fig. 9*).

Tumulus I at Mačkovec

In 2005 we excavated a tumulus north of the settlement remains (*Fig. 2: 2*). It lay on the edge of a wood, from where the terrain begins to rise gradually to the north in the direction of Sevno and on towards Trška Gora (428 m), and in the west towards Brezovica (266 m), a forest-covered hill (*Fig. 1*). Towards the south-east, the terrain descends gently towards the settlement of Mačkovec and on towards the river Krka.

The tumulus had an almost circular plan, with a diameter of 14 m and an extant layer of earth fill 1.5 m in height. The mantle of the tumulus was laid over calcareous rock (*Fig. 7*). We investigated and documented 13 graves distributed in a semicircle around Grave 9 – the central grave in the tumulus and also the oldest (*Fig. 8*). Grave 9 contained surviving traces of coffin and a stone structure incorporating outcroppings of bedrock. We also encountered weathered limestone under the rotted remains of coffins or grave goods in Graves 1, 3, 4, 8, 9, 12 and 13. These graves were entirely or at least partially dug into the "sterile" base or loam (SU 006), while Graves 2, 5, 6, 7, 10 and 11 lay in the tumulus fill (SU 004) (*Figs 7 and 8*). The cuts or fills of the grave pits were poorly distinguished from their surroundings. In some cases, as a result of the poor visibility, later graves had damaged older ones, as in the case of Grave 6, which had damaged Graves 10 and 11, or Grave 1, which had damaged Grave 2. The boundaries of Grave 7 were also determined on the basis of finds (*Fig. 8*). The fact that people were also buried in coffins is confirmed by traces of wood in Graves 8, 9 and 13.

Judging from the shape and size of the grave pits and the position of the grave goods, these were inhumation graves. As in the majority of other cases in Dolenjska, the presence of acidic and aggressive loam meant that no human bones or wooden coffins (apart from a few modest traces) survived here. The only exceptions in terms of human remains were some teeth in Graves 8 and 13 and traces of long bones in Grave 5. Anthropological analysis has shown that a child aged around four years old, or a little older, was buried in Grave 13, while Grave 8 is presumed to have contained a woman (Leben-Seljak, 2009: 84, 85). Grave goods allowed us to define some of the other burials by gender; these were found in all 13 graves (*Fig. 9*). The presence of typical female grave goods (jewellery) and male accoutrements (weapons and tools) allows us to conclude that seven women (Graves 1, 2, 5, 7, 8, 9, 11), four men (Graves 3, 6, 10, 12) and one child (Grave 13) were buried in the tumulus. In one case (Grave 4) it has not been possible to identify the sex of the person buried, since pottery was the only type of grave goods present. The disposition of the pottery allows us to establish the direction of burial. Within the Dolenjska Hallstatt group, pottery vessels are usually placed at the feet, while parts of costumes and jewellery lay in the positions where they would have been worn at the time of burial. The burials followed a clockwise sequence in the western half of the tumulus and an anticlockwise sequence in the eastern half. The central Grave 9 was oriented north–south with a slight deviation towards the west (*Fig. 8*).

We will compare the finds or the tumulus with contemporary graves from the tumuli at the Kapiteljska Njiva site. Borut Križ analysed 921 graves in 69 tumuli, along with 3,846 items. Of these graves, he classified 86 as belonging to the Serpentine Fibulae phase and 176 as belonging to the Certosa Fibulae phase (Križ, 2019).[8] In terms of chronological placement, we will follow the division of the Early Iron Age proposed by Stane Gabrovec.[9]

Elements of female costume

Circular jewellery is among the most commonly found grave goods in female graves. No complete sets of female accoutrements including earrings/hair rings, bracelets and anklets, and necklaces of glass and amber beads were excavated at Mačkovec (*Fig. 9*).

8 Križ, 2019; 241 graves contained no grave goods.

9 Gabrovec, 1964–1965; Gabrovec, 1987.

The occupants of Graves 1, 5, 8 and 11 were buried with solid bronze, evenly ribbed bracelets or anklets of round section. The bracelets are annular. The only exceptions are two slender bracelets from Grave 8, which have tapered overlapping ends. Anklets can be annular (Graves 5 and 8) or can have overlapping ends (Grave 11) or touching ends (Grave 1) (Udovč, 2009: 24, Figs 15, 22, 34).[10] The evenly ribbed annular examples can be defined as Type IIIa under Tecco Hvala's classification, while those with overlapping ends can be ascribed to Type IIIc (Tecco Hvala, 2012: 301, 306–307).[11] They are dated to the Late Hallstatt period, more precisely to the Serpentine Fibulae and Certosa Fibulae phases (Božič, 2018: 202). Solid ribbed anklets are one of the characteristics of Dolenjska Hallstatt costume, since the only known examples of anklets comparable to those from Dolenjska are from Hallstatt itself (Grahek, 2004: 148). The same number of anklets have been excavated from graves at the Kapiteljska Njiva site classified as belonging to the Serpentine Fibulae and Certosa Fibulae phases: namely 16 anklets from eight graves (Križ, 2019: 85, List 21).

A pair of anklets excavated from Grave 1 were found in their position as worn (Udovč, 2009: 12, Figs 15 in 16). In terms of shape they can be classified as Type IIIb (Tecco Hvala, 2012: 302, Fig. 111: 2). In Graves 5, 8 and 11, bracelets and anklets were lying in a secondary position and not in the position as worn (by the wrists or ankles). In Grave 11 they were lying at a point corresponding to the upper part of the body (Udovč, 2009: Figs 34 and 35). In Grave 5 they were placed, together with two bracelets of Type IVc (Tecco Hvala, 2012: 301, Fig. 111: 12), on the chest of the deceased woman. We assume that the dark colour is a trace of organic material or of a pouch or box in which anklets and bracelets were fastened with a fibula and needle (Udovč 2009: 15, Figs 22 in 23). In Grave 8, too, two thicker bracelets lay in the chest area while two thinner ones were found in the area corresponding to the wrists (Udovč 2009: 24, Fig. 28, G49–50, G52–53).

The disposition of ribbed jewellery was rarely documented in excavations from the late nineteenth/early twentieth century. Apart from at Mačkovec, it is recorded in the chest area or upper part of the body in Graves V/2 and VII/40 at Magdalenska Gora (Hencken 1978: 356, Fig. 102), at Novo Mesto (Kapiteljska Njiva, Grave 3/19 (Križ, 1997: 63–66, Panel 47) and Kandija, Graves 3/3, 3/33 (Knez, 1986: 61, Plate 59)), in Grave 26 from the Hrib necropolis in Metlika (Grahek, 2004: 160, Fig. 45), in Grave 30/4 at Ivanec near Družinska Vas (Guštin, Križ, 2007: 498) and in Grave 2 at the Grofove Njive site near Drnovo (Pavlovič, 2018: 357, Fig. 4).

Costumes from Graves 8 and 9 at Mačkovec can be compared to reconstructed costumes 3 and 4 from Vače and from Stična, as defined by Teržan (1985: 92). As a rule, anklets were only placed in the richest graves of adult females or were part of richer outfits (Teržan, 1985: 88, Fig. 11; Tecco Hvala, 2012: 309). Together with bracelets, necklaces of glass or amber beads, or fibulae and hair rings and vessels of various kinds, anklets were excavated at Stična from Tumulus 48 (Graves 29 and 131) and Tumulus 5 (Graves 4 and 13) (Gabrovec et al., 2008: Plates 24: 1–4; 76: 4–5; 109–110). The ribbed style of decoration of circular jewellery is typical of the sixth century BC (Teržan, 1974: 41). Such jewellery already appeared in the graves of the Dolenjska group in the Stična 2 horizon, became popular above all in the Serpentine Fibulae phase (Gabrovec, 1987: 59), but was also still present in the Certosa Fibulae phase (Božič, 2018: 202). Temple rings with overlapping ends, Type III according to Tecco Hvala, likewise denote the fashion of the sixth century BC (Tecco Hvala, 2007: 478–479). The combination of temple rings, and amber necklace and a serpentine fibula with wings from Grave 9 is also known from Tumulus 13 at Preloge near Magdalenska Gora (Tecco Hvala, 2012: 328).

Fibulae. A total of nine fibulae were excavated in five graves, including a band-like item from Grave 5 (Udovč, 2009: 24, G24, Grave 8: G48, Grave 9: G59, Grave 10: G65–G66, Grave 6: G29–32) which can provisionally be classified as a fibula. Grave 8 contained a slender three-knobbed fibula of Type VII (according to Ogrin's classification) or the Vinkov Vrh type, as worn in the Certosa Fibulae phase. This type is known in Dolenjska and the Soča Valley, while individual examples have been recorded along the central and southern stretches of the Sava (Donja Dolina, Sremska Mitrovica), as well as a single example in Jezerine, in the territory of the Iapydes (Ogrin, 1998: 127). A serpentine fibula classed as Type Va (a variant of Type V) by Tecco Hvala (2014: 133) and typical of the eponymous phase, was found in Grave 9, while another variant, Type VIIc (ibid. 138; 154–155) was found in Grave 10 along with a Certosa fibula which is likely belong to Type II under Teržan's classification. Grave 6 contained four Certosa fibulae of Type XIII (Teržan, 1976: 359–360, Fig. 30). These were worn in pairs by men in the late Certosa phase and the early Negova Helmets phase. As well as the two pairs of fibulae, this grave contained an awl, a whetstone, an iron knife, four amber beads and one glass bead with a white undulating line.

Sceptre. Grave 8 contained, in addition to pottery, ribbed circular jewellery, a three-knobbed fibula, a spindle whorl and a glass bead necklace, a damaged bronze sceptre with geometric decoration and triangular pendants with beaten decoration (Udovč, 2009: 26, G51). Sceptres are generally rare finds. At the Kapiteljska Njiva site in Novo Mesto they were only placed in rich female graves: in a destroyed grave in Tumulus 1, which Križ designated Find 1/1989 (Knez 1993: Plate 38), and in Grave 2 of Tumulus 29 (Križ, 2019: 83). The decoration consisting of alternating bands of reticular ornament and horizontal lines on the neck of the

10 Touching ends: G5–6, G74; annular: G27–28; overlapping ends: G73.

11 With indicated sites and cited literature.

Mačkovec sceptre is similar to the decoration on an example from Rovišče (Stare, 1973: 735, Pl. 4: 2), while the little plate at the top is similar to finds from the tumulus necropolis of Preloge near Magdalenska Gora (Tecco Hvala, 2012, Fig. 125: 7, 12). Sceptres or ritual rods were used by priestesses, who belonged to the upper class of Hallstatt society.

Elements of male outfits

Weapons were found in Graves 3 and 12 (*Fig. 9*). Grave 3 contained a spearhead, a winged axe,[12] a knife, and an awl and a trefoil pendant (Udovč, 2009: 26, G12, G13, G14 and G15), while Grave 12 contained a spearhead, an awl and a belt buckle (Ibid., 26, G77, G 78, G79). Axes of this type appear in the graves of Dolenjska warriors in the Negova Helmets phase (Tecco Hvala, 2012: 118). Rectangular iron belt buckles are represented in Dolenjska in richer inhumation burials with weapons and in combination with serpentine fibulae or fibulae with saddle-shaped bows or wings, and also with Certosa fibulae of Type XIII (Tecco Hvala, 2012: 168–169). The other graves which we defined as male contained craftsmen's tools such as awls, whetstones and knives (*Fig. 9*).

Earthenware

Earthenware was placed in all the graves with the exception of Grave 6 (*Fig. 9*). Footed bowls are the predominant type, followed by shallow dishes with inturned rims and spindle whorls. Eight footed bowls were found in five graves: two each in Graves 1, 7 and 10 and one each in Graves 5 and 3. These footed bowls can be classified as belonging to Types 3, 4, 5 and 10 according to Dular's classification (Dular, 1982: 85). Their walls are decorated with knobs or vertical ribs and a combination of both, and with appliqué bovids, indented walls or a combination of indentation and protomes. Only one was undecorated, while others were painted red with black bands (Udovč, 2009: 27, G1, G2, G38, G39, G61, G62, G11, G18). The closest comparisons are to be found at Kapiteljska Njiva in Novo Mesto, where footed bowls are found in richer graves, above all in those categorised as female (Križ, 2019: 98).[13] A total of 56 footed bowls were found in 45 graves there, the oldest of them being three from the Serpentine Fibulae phase. While this form of vessel is already present in the Stična 1 horizon (Dular, 1982: 44), it had its greatest flowering in terms of both design and technology during the Certosa Fibulae phase. Footed bowls usually had lids, as was the case of six of those found at Mačkovec. A red-painted footed bowl with a ribbed foot and button-shaped handle on the lid from Grave 5 at Mačkovec is similar to two footed bowls from Grave 15 in the "royal" Tumulus 3 at Kapiteljska Njiva (Udovč, 2009, G18; Knez, 1993, Plate 15: 2).

Six vessels with indented walls were found in the Mačkovec tumulus. Three of these belonged to Grave 10 (two footed bowls and a dish). A footed bowl in Grave 7 had indented walls, as did dishes in Graves 2 and 11 (*Fig. 9*) (Udovč, 2009, 27, Grave 2: G7, Grave 7: G39, Grave 10: G61–63, Grave 11: G70. The oldest examples of indented bowls at Kapiteljska Njiva, like the oldest footed bowls, belong to the Serpentine Fibulae phase. The largest number belong to the Certosa Fibulae phase (47 vessels from 42 graves). In this phase, they appear in rich, mainly female graves (Križ, 2019: 99). Dular dated the appearance of indentation to the Serpentine Fibulae phase and defined this method of decorating vessels as a characteristic of the Dolenjska group, since it rarely appears outside this area (Dular, 1982: 85). Teržan believes that this type of decoration appeared even earlier, in the Stična 2 phase, where she places the indented bowl discovered in House 1 at Stična, in Trench 18 (Teržan, 1990: 68; 1994b: 122, Plate 1: 9). An earlier appearance than the Certosa Fibulae phase is also pointed to by an indented bowl from Silovec above Orešje, found in a layer that has been radiocarbon dated to 2510 ± 25 BP (Kovač, 2014: 512, Figs 29, 4: 7; Teržan, Črešnar, 2014: 716, Figs 41, 42, 44). Footed bowls and indented bowls (*gubanke*) also appear in richer graves in tumuli on Magdalenska Gora (Tecco Hvala, 2012: 353), while they are extremely rare in the tumuli of Dolenjske Toplice, which were used for burials in the Certosa Fibulae and Negova Helmets phases.[14] A drinking set consisting of a goblet, a footed bowl and a cup with an overlapping handle (*Fig. 9*) was excavated in Grave 7 (Udovč 2009: 54–58, G38–41). Carefully crafted cups with overlapping handles have been found in both female and male graves at the Kapiteljska Njiva site. They appear in all chronological phases but are more common in earlier periods: there are 13 from the Podzemelj phase and 17 from the Stična phase, while only two can be placed in the Serpentine Fibulae phase, nine in the Certosa Fibulae phase and six in the Negova Helmets phase. They are usually part of a drinking set and are therefore only rarely found as the only vessel in (usually) rich graves. Drinking sets are even rarer, with only one appearing in the Serpentine Fibulae phase and five in the Certosa Fibulae phase (Križ, 2019: 96, List 28).

Structure of the tumulus

On the basis of the number of graves it contains, we class the tumulus, in the context of the Dolenjska group, among the smaller family tumuli typical of the lower course of the river Krka. It is comparable in terms of the number of graves to the Molnik tumuli, which numbered 10 to 14 graves (Tecco Hvala, 2017: 126). At the Kapiteljska Njiva site in Novo Mesto, 18 of the 69 investigated tumuli contained between 11 and 20 burials (Križ, 2019: 146).

The grave goods show that burials began in Tumulus I at Mačkovec at the end of the Serpentine Fibulae phase (Grave 9). The largest number of burials are from the Certosa Fibulae phase (Graves 1, 2, 4, 5, 7, 8, 10, 11, 12 and 13). Burials stop at the transition to the Negova Helmets horizon. Graves 3 and 6 could be classified as belonging to the latter. In terms of the richness of finds, Tumulus I at Mačkovec is comparable to the tumuli at Kapiteljska Njiva in Novo Mesto and on Magdalenska Gora that contained the graves of wealthier individuals. It stands out in terms of finds from other individual tumuli believed to have belonged to as yet unidentified unfortified settlements (Dular, 2003; Dular, Tecco Hvala, 2007: 149). Although there were no imported luxurious items such as bronze vessels in the tumulus at Mačkovec, it does appear that it was used to bury members of a wealthy family belonging to the upper class of society at that time.

It is also important to highlight the central grave in the tumulus. The oldest grave in the tumulus was the central grave – Grave 9. A woman was buried in it. By way of comparison, it should be mentioned that central graves were discovered in 20 of the total 69 tumuli at the Kapiteljska Njiva site in Novo Mesto. Seven of these central graves have been defined, on the basis of the grave goods they contained, as female graves and have for the most part been dated to the Podzemelj 2 phase (Križ, 2019: 113). In the majority of cases in the Dolenjska Hallstatt cultural group, the central grave was occupied by a man (Teržan, 2008: 201).

South of Tumulus I and north-west of the settlement we observed three further circular mounds that were reminiscent of tumuli. We tested the assumption by means of trial trenches and found that their convexity was the consequence of a different height or position of the calcareous geological substrate and its weathering. A few fragments of prehistoric pottery were dug up in this area.

Tumulus II at Mačkovec

In 2007 at least one other tumulus was investigated in the PSCM 4 area south of the settlement (*Figs 4: 4; 12: 12*). Two inhumation graves with finds and one without were documented in the first tumulus. A further five cuts of similar size were arranged in a circle in the vicinity. They contained no finds and we assume that they were graves without grave goods (*Fig. 10a*). A total of 110 Roman-era cremation graves were excavated next to Tumulus II (*Fig. 10b*).[15] The richest grave contained two ribbed bracelets and anklets with overlapping ends, a footed bowl with indented walls, a footed bowl with a lid, a goblet and a spindle whorl (*Fig. 11*) (Mason, Britovšek 2008). The finds belong to the Certosa Fibulae phase, like the finds from Tumulus I.

Discussion

The tumuli and settlement at Mačkovec lie on the boundary of, if not outside, the theoretically determined territory of the hillfort on the Marof hill in Novo Mesto, which is 2.7 km away as the crow flies. That habitation was not limited to the hillfort has been proved by research carried out in the bend of the Krka or in the medieval centre of Novo Mesto since 2000.[16] Burial grounds extend in a radius of 1.5 km (*Fig. 12*). On the left bank of the Krka, the tumulus burial ground of Kapiteljska Njiva (*Fig. 12: 1*) lies in the direct vicinity of the prehistoric hillfort on the Marof hill (*Fig. 12: 2*), while on the plateau further east is the flat burial ground of Mestne Njive (*Fig. 12: 3*). On the right bank of the Krka, running from west to east, are the tumuli of Portoval (*Fig. 12: 4*), Kandija (*Fig. 12: 5*), Zagrebška Cesta (*Fig. 12: 6*), Malenškova Njiva (*Fig. 12: 7*), Smolova Hosta (*Fig. 12: 8*) and Smolenja Vas (*Fig. 12: 9*). In view of the assumption that tumuli were built along roads and at crossroads, these tumuli could indicate the route of communications on the right bank of the Krka. The position of the tumuli, together with potsherds found in a sinkhole in Graben (*Fig. 12: 10*) (Lavrinc, 2014: 11) and fragments of burnt clay found in the vicinity of Ragovo (*Fig. 12: 11*) (Križ, 1981: 156), indicates a possible crossing over the Krka. From there the road perhaps ran past the tumuli and settlement at Mačkovec (*Figs 12: 12, 13 and 14*), where at the foot of Trška Gora it joined the main route running from west to east (Tecco Hvala, Dular, 2007: 222) or towards Veliki Vinji Vrh. This route is indicated by the presumed tumuli of Brezovica (*Fig. 12: 15*), Jakovec (*Fig. 12: 16*) and Farovške Njive near Otočec. A second possible route of communications from the east may have led to Marof via Mačkovec and Mestne Njive, while there are no documented sites along the present-day main road into the town from the west except at Bršljin, at the foot of Marof.

A similar picture is revealed by another important Hallstatt centre along the lower course of the Krka, consisting of the

12 Due to severe corrosion, the axe from Grave 3 was initially defined as a socketed axe (Udovč 2009, 26, G15). Following a new restoration intervention, it turned out to be a winged axe with wings on one side.

13 Eighteen were buried with 16 female deceased and just six with five male deceased. The remainder belonged to graves whose gender cannot be determined.

14 Dular, J. 1982, T. 6: 40; 7: 52, 56, 59, 60; 8: 62, 63, 66, 68, 69; 9: 82, 86; 10: 93, 97–99; 20: 173; 24: 220, 235; 26: 255; Teržan 1976: 385, T. 1–91.

15 The stratigraphy of the graves in the tumuli, the relationship with the Roman-era burial ground, and the finds will be presented in greater detail as part of the comprehensive treatment of the PSCM 4 site. The archaeological excavations were led by Phil Mason.

16 Fragments of Early Iron Age pottery have been found at the junction of Rozmanova Ulica and Kapiteljska Ulica (Tiran 2017). Postholes and a fireplace from this period have also been found on Rozmanova Ulica (*Fig. 15: 17*) (oral information provided by the supervisor of the archaeological investigation, Uroš Bavec of the Novo Mesto Regional Unit of ZVKDS).

fortified settlement of Veliki Vinji Vrh and numerous tumuli and flat burial grounds in the immediate surrounding area. Down on the plain, just 1,400 metres from here as the crow flies, settlement remains have been excavated at the Bela Cerkev–Pod Vovki site on the route of today's motorway, while tumuli have also been excavated at Dolge Njive, 400 metres further east.

Traces of Early Iron Age lowland settlement have also been uncovered (through archaeological field investigations carried out before the planned construction of the motorway) in Grofove Njive near Drnovo, closer to the confluence of the Krka and the Sava (Pavlovič, 2007: 76; idem 2014). The remains of presumably nine buildings were found to the east and west of the route, along with a small tumulus containing five graves in the vicinity. Surviving grave goods from these graves point to burials in the Certosa Fibulae phase. On the basis of similar earthenware found there, it may be concluded that the settlement dates from the same period (Pavlovič, 2014: 491–504). Spindle whorls, stone hand-mills, fragments of a clayey wall coating and the ruins of a stone foundation have been excavated in a lowland settlement at Marjanov Hrib near Studenec (Svoljšak, 2008: 85, Fig. 157).

The nature of these unfortified low land settlements from the Early Iron Age – were they examples of short-term habitation, hamlets, individual farms in the hinterland of larger centres? – is a difficult question to answer, since they have only been partially investigated. It is also difficult to determine their size, since there are no visible boundary structures on the surface. Judging from tools and utensils (e.g. hand-mills, spindle whorls) and animal bones discovered in settlement layers, we may conclude that the inhabitants of these settlements engaged in agriculture, livestock farming and crafts. Grave goods indicate that they were relatively wealthy. The sceptre found in one of the graves from the Mačkovec tumulus is a surprising find, since these are usually ascribed to priestesses.

Catalogue of finds

The finds are kept by the Dolenjska Museum in Novo Mesto. In describing pottery finds, we have used the parameters developed by Milena Horvat (1999, 16, 31).

List of abbreviations
l. – length
ext. – extant
dia. – diameter
rec. – reconstructed
w. – width
h. – height
th. – thickness

Plate 1

1. Rim fragment from shallow bowl with inturned rim. Structure: fine-grained; surface: smooth; colour: greyish brown (10YR 5/2). Rec. dia. 22 cm; ext. l. 5.3 cm; ext. w. 3.4 cm; th. 0.6–1.1 cm.
2. Rim fragment from shallow bowl with inturned rim. Structure: fine-grained; surface: smooth; colour: uneven, from light reddish yellow (5YR 6/4) to light brownish grey (10YR 6/3). Rec. dia. 19.5 cm; ext. h. 2.8 cm; ext. w. 2.9 cm; th. 0.6 cm.
3. Fragment of a pot rim. Structure: fine-grained; surface: smooth; colour: very pale brown (10YR 7/4). Rec. dia. 22.7 cm; ext. h. 3.65 cm; ext. w. 4.3 cm; th. 0.7 cm.

Stratigraphic unit 008
4. Partially preserved whetstone. Ext. l. 12.5 cm; ext. th. 1.5–3 cm; inv. no. P7201.
5. Fragment of stone hand-mill. Ext. l. 6.9 cm; ext. w. 5.7 cm; inv. no. P7202.
6. Handle. Structure: fine-grained; surface: smooth; colour: red-brown (2.5YR 4/3); firing: oxidation. Ext. l. 3.2 cm; ext. w. 3.6 cm; th. 2.7 cm.

Stratigraphic unit 012
7. Fragment of the base of a jar. Carinated transition from base to walls. Structure: coarse-grained; surface: rough; colour: dark brown (10YR 3/2), fracture: black; firing: reduction. Rec. dia. 13.4 cm; ext. l. 5.9 cm; ext. h. 4 cm.
8. Fragment of the rim of a dish. The rim widens outwards in a funnel shape. There is an elongated knob immediately below the rim. Structure: medium-grained; surface: rough; colour: uneven, from very pale brown (10YR 7/4) to dark grey (10YR 4/1); fracture: black; firing: uncontrolled. Rec. dia. 18.5 cm; ext. l. 4.7 cm; ext. w. 3.4 cm; th. 0.6 cm.
9. Fragment of a pithos. Appliquéd knob at the widest point. Structure: medium-grained; surface: rough; colour: yellowish-red (5YR 5/6); fracture: dark core, light surfaces; firing: reduction with oxidation in the final phase. Rec. dia. 33 cm; ext. l. 7.8 cm; ext. w. 4 cm; th. 0.78 cm.

Plate 2

1. Fragment of stone hand-mill. Ext. l. 9.3 cm; th. 6.6 cm; ext. w. 7.6 cm; inv. no. P7203.

Stratigraphic unit 014
2. Fragment of a pot rim. The rim is inturned and has a flat lip. Structure: medium-grained; surface: rough; colour: red-brown (2.5YR 4/3); fracture: dark core, light surfaces; firing: reduction with oxidation in the final phase. Rec. dia. 15 cm; ext. l. 6.2 cm; ext. w. 5 cm; th. 0.85 cm.
3. Damaged blue glass bead. Melted. The bead is flattened at the ends. Dia. 1.7 cm; inv. no. P7204.
4. Clay spindle whorl, biconic. Structure: fine-grained; surface: smooth; colour: brown (10YR 5/3). Dia. 3.9 cm; inv. no. P7205.

Stratigraphic unit 018
5. Clay spindle whorl, semicircular. Structure: medium-grained; surface: rough; colour; dark grey-brown (10YR 4/1). L. 4.2 cm; h. 3 cm; th. 1.25 cm; inv. no. P7206.
6. Partially preserved baking cover handle. Structure: coarse-grained; surface: rough; colour: red (2.5YR 4/6). Ext. l. 4.5 cm; ext. w. 4.4 cm; th. 2 cm; inv. no. P7207.

Stratigraphic unit 024
7. Whetstone. Ext. l. 9.7 cm; ext. w. 6.3 cm; th. 2.7 cm; inv. no. P7208.
8. Whetstone. Ext. l. 4.9 cm; ext. w. 3.3 cm; th. 0.9 cm; inv. no. P7209.
9. Damaged, badly scorched spindle whorl. Ext. h. 2.7 cm; inv. no. P7210.

Acknowledgements

My thanks go to Petra Stipančić and Simon Bobnar of the Dolenjska Museum and to Phil Mason, Andelka Fortuna Saje and Danilo Cvetko of the ZVKDS Centre for Preventive Archaeology. Petra Stipančić assigned inventory numbers to the material. Simon Bobnar carried out a new restoration/cleaning of the iron axe from Grave 3 in Tumulus I at Mačkovec.
Phil Mason kindly permitted the publication of the ground plans of the Mačkovec tumuli. Andelka Fortuna Saje drew the objects from the Mačkovec settlement (PSCM1), while Danilo Cvetko supplemented old graphical material and prepared new material.

Summary

The article presents a lowland settlement and tumuli at Mačkovec near Novo Mesto. On the basis of excavated grave goods, we classified Tumulus I among the richer tumuli within the Dolenjska Hallstatt group (Figs 8 and 9). The tumulus contained 13 graves, all of them with grave goods. It was used for burials from the Serpentine Fibulae horizon until the transition from the Certosa Fibulae phase to the Negova Helmets phase. The various types of grave goods excavated included indented vessels, footed bowls, ribbed jewellery, weapons and a sceptre. The tumulus stands out from the majority of tumuli in the Dolenjska region in that the occupant of the central and oldest grave (Grave 9) was a woman. A settlement with two structures was located to the south of the tumulus (Fig. 6). The smaller of the structures (Structure 1) was built with posts, while the larger (Structure 2) was built using a combination of post-pad construction and posts. Items excavated in the area of the settlement included coils, hand-mills, whetstones, potsherds, a glass bead, spindle whorls, a baking cover handle and house daub with impressions of branches. These finds date the settlement to the Certosa Fibulae phase. Excavations carried out to the south of the settlement probably relate to two further tumuli. Grave goods that place the tumulus or burials in the Certosa Fibulae period were only excavated in two graves of the southern Tumulus II (Fig. 10).

References

ANSI (1975): *Arheološka najdišča Slovenije.* – Ljubljana.

BOŽIČ, D. (2018): Grave 20 in Tumulus IV: Hallstatt-period burial of a woman at Znančeve njive in Novo mesto. Halštatski ženski grob 20 iz gomile IV na Znančevih njivah v Novem mestu. *Arheološki vestnik* 69, pp. 179–207.

DULAR, J. (1982): *Halštatska keramika v Sloveniji. Die Grabkeramik der älteren Eisenzeit in Slowenien: prispevek k proučevanju halštatske grobne keramike in lončarstva na Dolenjskem.* Dela 1. razreda SAZU 23.

DULAR, J. (2003): *Halštatske nekropole Dolenjske/Die hallstattzeitlichen Nekropolen in Dolenjsko.* Opera Instituti Archaeologici Sloveniae 6.

DULAR, J., TECCO HVALA, S. (2007): *South-Eastern Slovenia in the Early Iron Age. Settlement – Economy – Society/Jugovzhodna Slovenija v starejši železni dobi. Poselitev – gospodarstvo – družba.* Opera Instituti Archaeologici Sloveniae 12.

DULAR, J. (2008): Prazgodovinske lesne gradbene tehnike in njihova terminologija. *Annales: anali za istrske in mediteranske študije. Series historia et sociologia* 18.2., Koper, pp. 337–348.

DULAR, J. (2020): Nova spoznanja o poselitvi Dolenjske v starejši železni dobi. On the Early Iron Age settlement pattern of Dolenjska. *Arheološki vestnik* 71, pp. 395–421.

DULAR, J. (2021): *Gradivo za topografijo Dolenjske, Posavja in Bele krajine v železni dobi.* Zbirka E-Monographiae Instituti archaeologici Sloveniae, 10/1; 10/2; 10/3.

GABROVEC, S. (1964–1965): Halštatska kultura v Sloveniji. *Arheološki vestnik* 15–16, pp. 21–63.

GABROVEC, S. (1987): Dolenjska grupa. V/In: *Praistorija Jugoslavenskih zemalja* V, Željezno doba, Sarajevo, pp. 29–119.

GABROVEC, S. (1994): *Stična. 1, Naselbinska izkopavanja. Siedlungsausgrabungen.* – Katalogi in monografije 28.

GRAHEK, L. (2004): Halštatska gomila na Hribu v Metliki. *Arheološki vestnik* 55, pp. 111–206.

GRAHEK, L. (2016): *Stična. Železnodobna naselbinska keramika/Stična. Iron Age settlement pottery*. Opera Instituti Archaeologici Sloveniae 32.

Guštin, M., and Križ, B. (2007): Lady and her Attire. Reflections of status and Cult in Grave 30/4 from Ivanec near Družinska vas. V/In: *Scripta Praehistorica in Honorem Biba Teržan*, Situla 44, pp. 491–505.

HENCKEN, H. (1978): *The Iron Age Cemetery of Magdalenska gora in Slovenia*. American School of Prehistoric Research, Bulletin 32.

HORVAT, M. (1999): *Keramika. Tehnologija keramike, tipologija lončenine, keramični arhiv*. Razprave Filozofske fakultete, Ljubljana.

KNEZ, T. (1986): *Novo mesto. 1, Halštatski grobovi. Hallstattzeitliche Gräber.* – Carniola archaeologica 1.

KNEZ, T. (1993): *Novo mesto* 3. *Kapiteljska njiva. Knežja gomila/Fürstengrabhügel*. Carniola Archaeologica 3.

KOVAČ, O. (2014): Orešje na Bizeljskem. V/In: Teržan, B., Črešnar, M. (ur./eds), *Absolutno datiranje bronaste in železne dobe na Slovenskem/Absolute dating of the Bronze and Iron Ages in Slovenia*. Katalogi in monografije 40, pp. 505–514.

KRIŽ, B. (1981): *Topografija prazgodovinskih naselij v novomeški občini*. Diplomsko delo/Master thesis, Oddelek za arheologijo, Filozofska fakulteta, Univerza v Ljubljani (neobjavljeno/unpublished).

Križ, B. (1982): Brezovica. *Varstvo spomenikov* 24, p. 149.

KRIŽ, B. (1991): Sevno pod Trško goro. *Varstvo spomenikov* 34, p. 297.

KRIŽ, B. (2019): *Novo mesto. Kapiteljska njiva. Način pokopa v starejši železni dobi/Burial rite in the Early Iron Age*. Carniola Archaeologica 8.

LEBEN-SELJAK, P. (2009): Poročilo o antropološki analizi, Mačkovec-Gomila I, 2005. In: UDOVČ, K. *Mačkovec pri Novem mestu*. Zbirka Arheologija na avtocestah Slovenije 8, p. 84.

OGRIN, M. (1998): Trortasta fibula v Sloveniji (Die Dreiknopffibel in Slowenien). *Arheološki vestnik* 49, pp. 101–132.

OMAHEN, M. (2016): *Bronastodobna naselbina Mačkovec pri Novem mestu: analiza arheoloških ostalin in najdb iz izkopavanj leta 2010 in 2012 s poudarkom na sektorju 2*. Diplomsko delo/thesis, Oddelek za arheologijo, Filozofska fakulteta, Univerza v Ljubljani (neobjavljeno/unpublished).

PAVLOVIČ, D. (2007): *Grofove njive pri Drnovem. Halštatskodobna naselbina in gomila*. Diplomsko delo/thesis, Oddelek za arheologijo, Filozofska fakulteta, Univerza v Ljubljani (neobjavljeno/unpublished).

PAVLOVIČ, D. (2014): Drnovo. V/In: TERŽAN, Biba (ur.), et al. *Absolutno datiranje bronaste in železne dobe na Slovenskem. Absolute dating of Bronze and Iron Ages in Slovenia*. Katalogi in monografije 40, pp. 491–504.

PAVLOVIČ, D. (2018): Gospa z uhani z Grofovih njiv pri Drnovem. Lady with earrings from Grofove njive near Drnovo. V/In: Črešnar, M., Vinazza, M. (ur./eds) *Srečanja in vplivi v raziskovanju bronaste in železne dobe na Slovenskem: zbornik prispevkov v čast Bibi Teržan*, Ljubljana, pp. 353–366.

PLENIČAR, M., PREMRU, U., in HEREK, M. 1976, *Osnovna geološka karta SFRJ* 1 : 100.000, list Novo mesto L 33–79. Geološki zavod Ljubljana, Savezni geološki zavod, Beograd.

STARE, V. (1973): *Prazgodovina Šmarjete. Der vorgeschichtliche Komplex von Šmarjeta*. Katalogi in monografije 10.

SVOLJŠAK, D. (2008): Studenec. V/In: Svoljšak, D., et al., *Mrzlo Polje pri Ivančni Gorici*. Zbirka Arheologija na avtocestah Slovenije 5, pp. 82–85.

TECCO HVALA, S. (2007): Women from Magdalenska gora. V/In: *Scripta Praehistorica in Honorem Biba Teržan*, Situla 44, pp. 477–490.

TECCO HVALA, S. (2012): *Magdalenska gora. Družbena struktura in grobni rituali železnodobne skupnosti/Social structure and burial rites of the Iron Age community*. Opera Instituti Archaeologici Sloveniae 26.

TECCO HVALA, S. (2014): Kačaste fibule z območja Slovenije (Serpentine fibulae from Slovenia). *Arheološki vestnik* 64, pp. 123–184.

TECCO HVALA, S. (2017): *Molnik pri Ljubljani v železni dobi/The Iron Age site at Molnik near Ljubljana*. Opera Instituti Archaeologici Sloveniae 36.

TERŽAN, B. (1974): Halštatske gomile iz Brusnic na Dolenjskem (Die hallstattzeitlichen Grabhügel aus Brusnice bei Novo mesto). V/In: *Varia archaeologica*, Posavski muzej Brežice 1, pp. 31–66.

Teržan, B. (1985): Poskus rekonstrukcije halštatske družbene strukture v dolenjskem kulturnem krogu. *Arheološki vestnik* 36, pp. 77–122.

TERŽAN, B. (1994a): Überlegungen zum sozialen Status des Handwerkers in der frühen Eisenzeit Südosteuropas. V/In: Dobiat, C., (ur./ed.), *Festschrift für Otto - Herman Frey zum 65. Geburtstag*, Marburger Studien zur Vor- und Frühgeschichte 16, pp. 659–669.

Teržan, B. (1994b): 9., 18. in 19. sonda na prečnem nasipu gradišča. V/In: Gabrovec, S., *Stična* I. *Naselbinska izkopavanja/Siedlungsausgrabungen*. Katalogi in monografije 28, pp. 120–138.

TERŽAN, B. (2008): Stiške skice (Stična – Skizzen). V/In: TURK, Peter (ur./ed.), et al. *Stična* II/2. *Gomile starejše železne dobe. Razprave (Grabhügel aus der älteren Eisenzeit. Studien)*. Katalogi in monografije 38 (2010), pp. 189–325.

TERŽAN, B., ČREŠNAR, M. (2014): Poskus absolutnega datiranja starejše železne dobe na Slovenskem/Attempt at an absolute dating of the Early Iron Age in Slovenia. V/In: Teržan, B., Črešnar, M. (ur./eds), *Absolutno datiranje bronaste in železne dobe na Slovenskem/Absolute dating of the Bronze and Iron Ages in Slovenia*. Katalogi in monografije 40, pp. 703–724.

UDOVČ, K. (2008): Novo mesto-Gomila Mačkovec. *Varstvo spomenikov* 44, p. 178.

UDOVČ, K. (2009): *Mačkovec pri Novem mestu*. Zbirka Arheologija na avtocestah Slovenije 8. [http://www.zvkds.si/media/images/publications/008_Mackovec_pri_Novem_mestu.pdf].

VOJAKOVIĆ, P., PORENTA, S., TOŠKAN, B. (2014): Novo odkritje prazgodovinske poselitve ob vznožju gradišča Sv. Marjeta na Libni/New discovery of a prehistoric dwelling below the hillfort of Sv. Marjeta on Libna. *Arheološki vestnik* 65, pp. 101–121.

Resources

Unpublished reports.

LAVRINC, M. (2014): *Poročilo o arheološkem terenskem pregledu v obliki strojno-ročno izkopanih testnih jarkov na parceli št. 217/10, k. o. Ragovo* (kept by: ZVKDS, Novo Mesto Regional Unit archives).

MASON, P., PREDAN, P. and BRITOVŠEK, T. (2007): *Poročilo o arheološkem vrednotenju na območju poslovno storitvene cone Mačkovec*, Novo Mesto (kept by: ZVKDS, Novo Mesto Regional Unit archives).

Mason, P. and Britovšek ,T. (2008): *Poslovno storitvena cona Mačkovec. Poročilo o arheoloških izkopavanjih na območju PSCM 4*, Novo Mesto (kept by: ZVKDS, Novo Mesto Regional Unit archives).

MURKO, M. (2010): *Preliminarno poročilo o arheoloških izkopavanjih na arheološkem najdišču PSCM 2010 cona 1a jug* (kept by: ZVKDS, Novo Mesto Regional Unit archives).

MURKO, M., OMAHEN, M., STRAŠEK, M. (2012a): *Poročilo o arheoloških izkopavanjih na arheološkem najdišču PSC Mačkovec, cona 1a/jug faza 1,2* (kept by: ZVKDS, Novo Mesto Regional Unit archives).

MURKO, M., OMAHEN, M., STRAŠEK, M. (2012b): *Poročilo o arheoloških izkopavanjih na arheološkem najdišču PSC Mačkovec, cona 1a/jug faza 3* (kept by: ZVKDS, Novo Mesto Regional Unit archives).

Tica, G. (1999): *Poročilo o rezultatih ekstenzivnega arheološkega pregleda na odseku Hrastje – Kronovo*, Ljubljana (kept by: ZVKDS, Novo Mesto Regional Unit archives).

PREDAN, P. and BREMEC, R. (2020): *Prvo strokovno poročilo o arheoloških raziskavah za določitev vsebine in sestave najdišč na območju nepremične kulturne dediščine Smolenja vas/Mahovnice (EŠD 3994), Velika Cikava (EŠD 956), Velike njive (EŠD 9447), Žabja vas (EŠD 15640) in Brezovica (EŠD 15643) ter odstranitvi arheoloških ostalin na območju Brezovica (EŠD 9468 in EŠD 15643) pred izgradnjo cestne komunikacije 3. razvojne osi pri Novem mestu* (kept by: ZVKDS, Novo Mesto Regional Unit archives).

TIRAN, A. (2017): *Poročilo o arheološkem testnem izkopu v mestnem jedru Novega mesta – 1. faza, parc. št. 1468, 1642, 1641, 1643, 1680 in 1795, vse k. o. Novo mesto* (kept by: ZVKDS, Novo Mesto Regional Unit archives).

Udovč, K., and Mason, P. (2006): *Poročilo o sistematičnem intenzivnem arheološkem terenskem pregledu na območju poslovno storitvene cone Mačkovec* (kept by: ZVKDS, Novo Mesto Regional Unit archives).

Udovč, K. (2007): *Poročilo o arheološkem izkopavanju na lokaciji Poslovno-storitvene cone Mačkovec – PSCM 1*, Novo Mesto (kept by: ZVKDS, Novo Mesto Regional Unit archives).

Katarina Udovč

Prezentacija taborskega obzidja pri cerkvi sv. Kancijana in tovarišev v Mirni Peči

Strokovni članek
COBISS 1.01

UDK
726:903/904(497.4Mirna Peč)

Ključne besede: prafara, slovansko grobišče iz 10. do 11. stoletja, protiturški tabor, prezentacija *in situ*

Izvleček

Leta 2016 so ob prenovi okolice cerkve s predhodnimi arheološkimi raziskavami odkrili slovansko grobišče iz 10. do 11. stoletja. Njegovo odkritje vsaj deloma pojasnjuje, zakaj so v Mirni Peči ustanovili eno starejših župnij. Okrog cerkve smo dokumentirali in izkopali temelje srednje velikega protiturškega tabora z začetka 16. stoletja in dela srednjeveške cerkve, po vsej verjetnosti stranske kapele. Temelje smo prezentirali v tlaku *in situ*, temelje cerkve pa pod pohodnim steklom. Predstavili bomo argumente, zakaj smo se odločili za tovrstni prezentaciji, ter priporočila in načela mednarodnih dokumentov, ki smo jim sledili.

Uvod

Mirna Peč je ena manjših in mlajših dolenjskih občin ter ena najstarejših župnij. Meji na trebanjsko, novomeško, straško in žužemberško občino ter na občino Mokronog – Trebelno. Mirnopeško občino sestavljajo tri doline, Mirnopeška, Globodolska in Šentjurska. Konec leta 2015 je investitor Župnija Mirna Peč dal pobudo za ureditev prostora okrog mirnopeške cerkve. Povod za ureditev okolice je bilo praznovanje 100. obletnice posvetitve cerkve v letu 2017. Vhod v cerkev je bil do leta 2014 z lokalne ceste Mirna Peč–Dobrnič, hodna površina je bila peščena in travnata (slika 1). V ustnem izročilu se je ohranil spomin na protiturški tabor, zato so želeli novi ureditvi zagotoviti dodano vrednost z njegovo prezentacijo. Prezentacijo bomo predstavili v luči problematike rekonstrukcij arheološke dediščine in prezentacij na prostem ter komunikacije.

Nastanek župnije in protiturškega tabora

Prvo evidentirano arheološko najdišče v bližini Mirne Peči leži na hribu Sv. Ana, ki na severu, ob meji s trebanjsko občino, zapira Mirnopeško dolino. Območje prazgodovinskega gradišča, gomilnega in planega grobišča je skupaj s cerkvijo sv. Ane razglašeno za kulturni spomenik lokalnega pomena (Uradni list RS, št. 38/92). V Mirnopeški dolini do leta 2016 ni bilo evidentiranih arheoloških najdišč.

V Mirni Peči so ustanovili eno najstarejših župnij na Slovenskem, prafaro. Župnija sv. Kancijana in tovarišev v Mirni Peči je obstajala že v prvi polovici 12. stoletja in je bila v patriarhovih polnih pravicah. Po vsej verjetnosti so jo ustanovili v okviru župnijske reforme v drugi polovici 11. stoletja. Možno pa je, da je še starejša. Župnik je prvikrat omenjen leta 1228, župnija sama pa kot plebs leta 1274. Omenjena je tudi v papeškem desetinskem seznamu iz leta 1296. Patrocinij izdaja oglejski vpliv. Cerkev sama pa je poleg tiste v Kranju najstarejša na Slovenskem s tem patrocinijem. Leta 1495 je bila mirnopeška župnija priključena novoustanovljenemu kolegiatnemu kapitlju v Novem mestu (Höfler 2016: 289). Od leta 2006 sodi župnija pod novomeško škofijo.

Srednjeveška cerkev, posvečena sv. Kancijanu in tovarišem, se prvič omenja leta 1526. Cerkev je na prehodu iz 19. v 20. stoletje postala premajhna, zato so se pojavile ideje o gradnji nove cerkve ali povečanju stare. Načrte za novo cerkev je leta 1908 izdelal arhitekt Josip Vancaš. Novo cerkev so v neogotskem slogu zgradili med prvo svetovno vojno, v letih 1914–1915, posvetili pa leta 1917. Ker so porušili staro cerkveno ladjo in pravokotno nanjo pozidali novo, so ohranili star prezbiterij, ki je danes stranska kapela in zvonik (Damjanović, 2014: 263; Pust, 1987: 40–43). Star gotski prezbiterij s kitastim obokom, ki počiva na geometrijskih konzolah, je dober primer poznogotskega stavbarstva, zato je bil leta 1992 razglašen za kulturni spomenik lokalnega pomena (Uradni list RS, št. 38/92); protiturški tabor v odloku ni omenjen. V prezbiteriju srednjeveške cerkve naj bi bili vzidani kamni starejše, romanske cerkve. Zvonik so obnovili in povišali leta 1996. Srednjeveško cerkev so zgradili v smeri vzhod–zahod, dograditi pa v smeri sever–jug. Stara cerkev je do zvonika merila približno 8 × 27 m, novi del pa 34 × 17 m.

Protiturški tabori na Slovenskem so ena izmed inačic množičnih ljudskih utrdb, ki so služile kot zatočišča v primeru vojne nevarnosti ali roparskega pohoda. Uporabljali so jih za stalno ali začasno hrambo živeža, živine in cerkvenih dragocenosti. So dokaz samosvojega kmečkega koncepta obrambe pred Turki. Njihova gradnja se je razmahnila v 15. in 16. stoletju. Za prebivalstvo so imeli delno utrdbeno, delno socialno vlogo (Fister, 1975: 7–9). V Mirnopeški dolini ni bilo utrjenega poslopja, kamor bi se lahko zateklo prebivalstvo pred turško nevarnostjo, zato je okoli leta 1500 Jurij Slatkonja, kasnejši dunajski škof, zaprosil cesarja Maksimiljana za dovoljenje za gradnjo tabora oziroma utrditev cerkve (Dolinar, 1993: 15). Turški vpadi na slovensko ozemlje so se začeli po letu 1400, vendar se je glavnina roparskih vpadov zvrstila po turški zasedbi Bosne, torej po letu 1463. V času od leta 1469 do leta 1483 so Turki skoraj vsako leto, včasih celo po večkrat, pridrveli v naše kraje ter ropali in načrtno uničevali deželo. Med glavne turške vpadnice proti zahodu je sodila pot skozi Belo krajino. Leta 1471 so Turki požgali kartuzijo Pleterje, leta 1473 so bili v okolici Novega mesta, Mirne Peči in Trebnjega, prav tako leta 1476, ko so krenili po dolini Krke navzgor. V letih 1491, 1493 in 1511 so prišli v okolico Soteske, leta 1528 so bili ponovno v okolici Mirne Peči in Trebnjega (Jug, 1943: 12–61; Voje, 1996: 33). Taborsko obzidje s kaščo, stolpi in cerkvijo je leta 1603 ali 1604 skiciral Ivan Klobučarić (slika 2). Na skici so upodobljeni severozahodni in jugozahodni stolp okroglega tlorisa, severovzhodni stolp pravokotnega tlorisa in pravokotni objekt, ki je bodisi kašča bodisi staro župnišče, ter obzidje z linami. Objekt je Fister interpretiral kot kaščo (Fister, 1975: 85). Na mestu pravokotnega stolpa in objekta so zgradili župnišče in šolo. Nad vhodnim portalom župnišča je letnica 1777.[1]

Predhodne arheološke raziskave in ugotovitve

Pokopališče so okrog leta 1825 preselili na današnjo lokacijo (Pust, 1987: 56), na hrib jugovzhodno od Mirne Peči. Lokacija novega pokopališča je vrisana že v franciscejskem katastru. Na lokacijo pri cerkvi spominja ledinsko ime večjega travnika zahodno od cerkve med lokalno cesto proti Dobrniču in Temenico, Za Britofom (slika 2). Pokopališče je bilo večkrat poškodovano z gradbenimi posegi. Prvič so ga poškodovali z gradnjo protiturškega obzidja, sledila je gradnja župnišča, šole in cerkve med prvo svetovno vojno. Med drugo svetovno vojno so na obravnavanem prostoru Italijani kopali vojaške rove, pri čemer so naleteli na temelje mogočnega zidu. Na cerkev je med drugo svetovno vojno padlo nekaj granat in jo tudi poškodovalo. Zadnji posegi, ki so degradirali območje pokopališča, so izkopi za infrastrukturne vode, meteorno kanalizacijo, javno razsvetljavo, elektriko, strelovod (slika 3). Pobuda o prezentaciji je bila dobrodošla, saj je večina dosedanjih posegov potekala brez arheoloških raziskav, čeprav jih varstveni režim predvideva.

Zaradi preverjanja stopnje in obsega ohranjenosti protiturškega obzidja je ZVKDS v kulturnovarstvenih pogojih predpisal pregled območja z georadarsko raziskavo.[2] V raziskavo smo vključili zemljišča s parc. št. *71, 616, 617 in del 2886/12, vse k. o. Mirna Peč. V plitvejših globinah so georadarski odboji do globine 0,95 m nejasni, kar potrjuje, da so bile arheološke plasti in strukture z zgoraj omenjenimi posegi poškodovane. Na osnovi odbojev so dokumentirali linearne strukture in eno okroglo (slika 4) (Arhej, 2016). Odboje smo preverili z invazivno arheološko raziskavo za določitev vsebine in sestave najdišča oziroma z izkopom dveh arheoloških sond. Arheološke raziskave je vodil L. Rozman iz kranjskega podjetja Magelan skupina, d. o. o. V sondi zahodno od cerkve so 0,30 m pod današnjo hodno površino odkrili od 0,8 do 1 m široke temelje, vezane z malto, ki so v globino segali do 1,30 m. Če odkritje temeljev ni bilo presenečenje, nas je presenetilo odkritje slovanskega grobišča. Odkrili smo ga pod temelji protiturškega tabora, na globini 1,7 m pod današnjo hodno površino. Na površini 15 m^3 so izkopali dva zgodnjesrednjeveška

1 Župnišče je vpisano v Register nepremične kulturne dediščine kot evidenčna enota Mirna Peč – staro župnišče (EŠD 26056).

2 Raziskavo je izvedlo podjetje Arhej oziroma dr. T. Verbič. Uporabili so opremo MalaGeoscience.

Katarina Udovč, Zavod za varstvo kulturne dediščine Slovenije, katarina.udovc@zvkds.si

grobova, dokumentirali pa še nadaljnjih osem.[3] Arheološka izkopavanja grobišča (ocenjena površina 350 m^3) se niso izvedla, saj bi presegla trenutno skonstruiran finančni okvir investitorja, prav tako se na območje grobišča z gradbenimi deli v tej fazi ni posegalo. Izkopavanja bo treba izvesti pred urejanjem intervencijske poti in obnove opornega zidu na južni strani. Grobovi so bili orientirani v smeri vzhod–zahod in vkopani v geološko osnovo. Od obeh skeletov se je ohranilo nekaj lobanjskih in odlomki dolgih kosti. V dveh grobovih so izkopali bronast grozdasti uhan z lokom iz žice, ulite bronaste obsenčne obročke ter srebrn prstan ob desni golenici. Po najdbah sodeč, grobišče uvrščamo v 11. stoletje. V sondi bližje cerkvi, na območju srednje- in novoveškega grobišča, so na globini 0,6 m izkopali človeške kosti v sekundarni legi (Udovč, Rozman, 2017: 147–148). Na Dolenjskem so grobove iz 10. do 11. stoletja, ki bi jih lahko povezovali z nastankom zgodnjesrednjeveških župnij, izkopali v Beli Cerkvi, Trebnjem, Tržišču, Šentrupertu (Mason, 2018: 93–94, slika 4).

Na vzhodnem delu, med cerkvijo in župniščem, so med arheološkim dokumentiranjem ob gradnji naleteli na ovalno jamo, zapolnjeno s človeškimi kostmi. Domnevamo, da so vanjo pokopali kosti iz prekopanih grobov oziroma iz grobov, uničenih med preteklimi gradbenimi posegi. Jamo so dokumentirali in zasuli. Kosti, izkopane ob tokratnih gradbenih delih, naj bi pokopali na današnjem pokopališču.

Protiturški tabor

Mirnopeški tabor je imel nepravilno štirikotno, skoraj trapezno obliko. Uvrščamo ga med srednje velike tabore, krajša stranica je merila približno 27 m, daljša pa 45 m. Temelji so bili najbolje ohranjeni na zahodni in severni strani (slika 5). Na južni strani so bili večinoma uničeni z gradnjo prezbiterija nove cerkve, na vzhodni strani pa se temelji nadaljujejo pod župnišče. Zaradi načina gradnje so temelji različno široki. Širina zahodnega zidu variira od 0,75 do 1,1 m, širina južnega je okoli 0,8 m. Zidove protiturških taborov so gradili s polaganjem zunanjega in notranjega zidu brez opaža, sredino pa so zasuli z drobirjem in živoapneno malto. Z njo so bili vezani tudi kamniti lomljenci (Fister, 1975: 38–40). Od dveh stolpov, upodobljenih na Klobučaričevi skici, so se ohranili temelji severozahodnega stolpa z notranjim premerom 3,1 m. V primerjavi z obrambnimi stolpi drugih taborov je bil manjši. Stolpa v Semiču sta imela premer 6,15 in 6,95 m (Dražumerič, Britovšek 2014; Britovšek, Kovač, 2017: 207). Med arheološkimi raziskavami smo poglobili lokacijo na jugozahodnem stičišču temeljev, kjer bi po skici lahko stal drugi stolp. Temeljev nismo odkrili. Bili so neposredno ob opornem zidu, zato dopuščamo možnost, da so bili odstranjeni pri gradnji. V literaturi je navedeno, da je bilo do leta 1856 okoli cerkve še razpadajoče obzidje (Pust, 1987: 36). Ruševine so uporabili za gradnjo šole zraven župnišča. V franciscejskem katastru niso vrisani niti taborsko obzidje niti stolpi (gl. sliko 2). Prezentacijo taborskega obzidja je omogočila prestavitev lokalne ceste proti Dobrniču, na traso severneje. Cesto so prestavili leta 2014, ko so zgradili nov trgovski center v Mirni Peči. Ob urejanju okolice so naleteli na kamnit zid. Sledila so arheološka izkopavanja, s katerimi so potrdili, da gre za temelje novoveške t. i. Osterčeve hiše, niso pa odkrili starejših ostalin (Kovač, 2014: 2).

Prezentacija protiturškega tabora

Projekt za ureditev je izdelalo podjetje Struktura, d. o. o., iz Mirne Peči. Razdeljen je na tri faze: na prenovo zunanje ureditve cerkve, prenovo župnišča in zunanjo ureditev okoli župnišča. V nadaljevanju bo predstavljena prva faza oziroma ureditev zunanje okolice cerkve sv. Kancijana in tovarišev, preostali fazi sta premaknjeni v prihodnost.

Pri idejni zasnovi so se oprli na tloris, ki so ga izrisali pred gradnjo cerkve med prvo svetovno vojno in med njo (hrani ga Zgodovinski arhiv Ljubljana, Enota za Dolenjsko in Belo krajino, Novo mesto) (sliki 6a in 6b).

V nadaljevanju bomo predstavili prezentacijo z vidika komunikacije in usklajevanja različnih pogledov in želja, saj prezentacija pomeni ureditev dediščine, ki jo uresničujemo z javnostjo in za javnost (Pirkovič, 2012: 14). V primeru mirnopeškega tabora je izraz prezentacija mišljen kot strokovni termin, ki definira ureditev nekega spomenika in njegovih delov na način, da bo dostopen in razumljiv širšemu krogu ljudi. Vsi ukrepi so podrejeni usmerjanju občinstva in posredovanju informacij (Pirkovič, 1993: 159–160). Način predstavljanja oziroma ozaveščanja javnosti v 9. členu podpira tudi Malteška konvencija,[4] prav tako javno korist varstva dediščine in njen družbeni pomen zajemata 2. in 3. člen ZVKD-1. Za prezentacijo temeljev protiturškega tabora smo izbrali rekonstrukcijo v tlaku *in situ*, čeprav tovrstnim prezentacijam listine[5] niso najbolj naklonjene. Beneška listina v 15. členu izključuje vsakršna rekonstrukcijska dela na arheoloških ostalinah (Doktrina, 2014: 27), medtem ko Burrska listina v 14. členu priznava oziroma dovoljuje rekonstrukcije kot eno od oblik ohranjanja dediščine, zahteva pa, da morajo biti vse spremembe na spomeniku reverzibilne (člen 15.2). Laussanska listina rekonstrukcijam arheološke dediščine v 7. členu pripisuje eksperimentalno raziskovalni in interpretacijski pomen, hkrati pa poudarja, da mora biti rekonstrukcija vedno prepoznavna (Doktrina, 2003: 49). Za delno rekonstrukcijo *in situ* smo se odločili zaradi prostorske omejenosti in avtentičnosti tlorisa tabora. Na južni strani prostor omejuje oporni zid, ki dviguje ploščad s cerkvijo nad poplavno ravnico Temenice, na vzhodu je staro župnišče, pod katerim se nadaljujejo temelji tabora. Večje tlorisne dimenzije cerkve in župnišče so izničili občutek o njegovi prvotni velikosti. Reverzibilnost smo zagotovili s tem, da smo dokumentirane in očiščene temelje taborskega zidu in stolpa prekrili s PVC-folijo in nanjo betonirali ločilno armiranobetonsko (AB) ploščo debeline 10 cm. Na ločilno AB-ploščo so rekonstruirali temelje. Pri pozidavi smo skušali čim bolj verodostojno posnemati videz in način gradnje originalnih temeljev. Fuge so izvedli s sivim cementom. Na zunanjo stran so pozidali večje kamne, v notranjosti pa manjše oziroma drobir. Kot gradbeni material so uporabili lomljenec iz najbližjega kamnoloma, Sv. Ane nad Vrhpečjo (Udovč, 2018: 177–159). Tu se lahko navežemo na avtentičnost, saj so za gradnjo taborov uporabljali lokalni kamen (Fister, 1975: 37). Projektna dokumentacija je ob notranji strani zidu predvidevala kanal za kanaleto, pri čemer so tako kot ob zunanji liniji ohranili originalen zid. Na notranji strani so izvedli tesnitev pred vdorom vode, zunanjo stran so zaščitili in zasuli s tamponom. Na mestih, kjer ni bilo zidu, se je do globine 1 m, v liniji s temelji, zgradil AB-temelj. Pri pozidavi je bilo treba paziti na naklon zaradi odvodnjavanja vode (Struktura, 2016: 10), saj bi zastajanje in zmrzovanje vode lahko povzročilo poškodbo na tlaku. Lahko bi se odločili za lažje in hitreje izvedljivo ter ekonomsko ugodnejšo prezentacijo v betonu, vendar smo želeli prikazati način gradnje prvotnega tabora, saj so se od njega ohranili le temelji. Jugozahodni vogal je tudi v prezentaciji, tako kot v originalu, zgrajen iz klesanih večjih kamnov. Tesane klade so uporabljali le pri zidavi vogalov, drugje so uporabili lomljenec (Fister, 1975: 37). Prvotno idejo o prezentaciji so morali dopolniti z vrisom novoodkritega stolpa (gl. sliki 3 in 8). Stolp in stik stolpa s temelji tabora so poškodovali novodobni infrastrukturni vodi. Prezentacijo stolpa je osmislila prestavitev vodov za stolp, kar bo preprečilo dodatno uničevanje stolpa ob morebitnih okvarah. Obod stolpa so izdelali s pločevinastim trakom, notranjost so pozidali (slika 7). Pred vhodom v cerkev, na severni strani, je bila linija temeljev ponekod prekinjena (gl. sliko 3). Na tem delu temelje prekriva bel beton, ki se v liniji in širini zidu vije do stolpa. Idejo, da je pred vhodom v cerkev širši bel beton, ki predstavlja »preprogo«, smo kljub prvotni želji po neprekinjenem prikazu linije sprejeli (slika 8). Cerkev je v časih, ko so okoli nje zgradili obzidje, nudila poleg duhovne utehe tudi fizično zatočišče.

Na jugozahodni strani cerkve, pred vhodom v današnjo stransko kapelico, so prezentirani temelji, ki pripadajo starejši, po vsej verjetnosti gotski gradbeni fazi cerkve. Objekt nad temelji je upodobljen v franciscejskem katastru za Kranjsko iz leta 1825 (gl. sliko 2) in na fotografiji, posneti leto pred rušitvijo cerkve (Pust, 1987: 40). Vancaš ga je interpretiral kot stransko kapelico oziroma prostor za spoved (načrt Zgodovinski arhiv Ljubljana). Objekt so med dozidavanjem cerkve v novem veku porušili. Navedli smo zadnjo interpretacijo, saj natančnejša analiza zgodovine stavbnega razvoja cerkve še ni bila narejena. Med temelji tudi ni bilo izkopanih najdb, ki bi omogočale natančnejšo časovno umestitev. Predlagali smo prikaz temeljev s širšimi fugami v končnem (finalnem) tlaku. Med lokalno skupnostjo se je razširilo mnenje, da gre za temelje romanske cerkve.[6] Na pobudo in željo lokalne skupnosti so temelji prezentirani pod steklom, kljub tehtnim pomislekom ZVKDS glede tehnične izvedbe ustreznega prezračevanja. V obzidanem, toplotno in hidroizoliranem prostoru so pokriti s pohodno stekleno ploščo (slika 9). V prostoru sta urejena prezračevalni sistem in osvetlitev. Toplotna izolacija in prezračevalni sistem ne preprečujeta razraščanja alg in rastlin ter kondenzacije stekla. Zasteklitev je na prostem,[7] zato je pod večjim vplivom temperaturnih nihanj kot tiste v stavbah, npr. v cerkvi na Blejskem otoku (Petru, 1974: 82), v gradu Rajhenburg, cerkvi Sv. duha in Pastoralnem centru v Črnomlju ... V slednjem so za zaščitno pregrado iz ogrevanega stekla, ki jo je zasnoval M. Kovač,[8] prezentirani ostaline iz pozne antike in mestno obzidje iz 15. stoletja (Mason, 1999: 40–41).[9] O problemu prezračevanja in kondenzacije zastekljene površine poročajo tudi iz Beograda, kjer je na Rajičevi ulici, pred vhodom v trgovski center, pod zastekljeno površino v delni rekonstrukciji prikazana cesta iz rimske dobe oziroma Singidunuma (Plemić, 2018: 10).

S prenovo okolice je pred cerkvijo nastal manjši trg. Zamišljen

3 Po potrditvi arheološkega najdišča smo v skladu z 27. členom ZVKD-1 izdali odločbo o arheološkem najdišču. Sledil je vpis v Register nepremične kulturne dediščine pod imenom Mirna Peč – arheološko najdišče sv. Kancijan (EŠD 30348).

4 Konvencija je pogodba med dvema ali več državami in je za podpisnice mednarodnopravno obvezujoča (Petrič, 2000: 5).

5 Mednarodne listine in priporočila so oblikovani na osnovi najboljših strokovnih stališč in mnenj v času sprejetja (Fister, 2003: 11) ter pomenijo neke vrste mehko obliko zakona (soft law) (Petrič, 2000: 21).

6 Kot romanske jih interpretira tudi arhitekt in projektant J. Slak iz Strukture (https://www.odprtehiseslovenije.org/objekt/zunanja-ureditev-okoli-cerkve-v-mirni-peci).

7 V Novalji na Pagu so prav tako na prostem pod steklom prezentirani mozaiki iz 6. stoletja n. št., vendar se tudi tam pod stekleno površino razraščajo alge in druge rastline, čeprav je podnebje drugačno, bolj suho.

8 Sistem Eureka! EU 1586 (arch-in-situ) predstavlja posebno steklo, po katerem lahko obiskovalci varno stopajo čez podzemne arheološke objekte in si jih ob tem ogledujejo takšne, kot so bili najdeni, hkrati pa so ti objekti zaščiteni pred propadanjem; razvil ga je arhitekt Milan Kovač. Zaščiteni arheološki objekti potrebujejo podobne klimatske pogoje, v katerih so ostali ohranjeni skozi tisočletja. V Sloveniji je bilo steklo prvič uporabljeno v cerkvici sv. Jurija pri Slovenj Gradcu leta 1994, potem pa še v *Pastoralnem centru v Črnomlju* (https://www.delo.si/novice/slovenija/inovativni-varuh-arheloske-dedisci-ne-pogumni-podpornik-beguncev/, dne 26.2. 2019).

9 Smiselno bi bilo narediti pregled in analizirati rešitve oziroma zaščito prezentiranih objektov *in situ*, vendar bi to preseglo okvirje tega članka. V mirnopeškem primeru bi nadstrešek skazil veduto in podobo cerkve ter zmanjšal funkcionalnost prostora okrog nje. Z obnovo pa so želeli pridobiti ravno večji prostor.

je kot manjši poljavni prostor za bogoslužne namene (slika 10). Tlakovan je z betonskimi ploščami velikosti 1,5 × 2,4 m (Struktura, 2016: 14). Leži tik ob cesti, nasproti trgovine. Parkirni prostor pred trgovino uporabljajo tudi obiskovalci cerkve oziroma bogoslužja. Za varnost obiskovalcev skrbijo masivni konfini, ki do neke mere preusmerjajo pozornost od prezentacije, hkrati pa vizualno ločujejo posvetno območje od svetega. Predlog o manj opazni, a kljub temu varni in ekonomsko ugodnejši ograji ni bil sprejet. Ideja projektanta je bila, da se konfini uporabljajo kot sedeži. Pregrada oziroma konfini tudi niso naleteli na odobravanje celotne lokalne skupnosti. Postavitev vodnjaka in infrastrukturnih vodov smo pogojevali na že obstoječi lokaciji in po obstoječih vodih. Za obe strani ustrezno rešitev smo dosegli pri vzhodni liniji zidu, ki se nadaljuje pod župniščem in na zemljišču izven tokratnega gradbenega posega. Prenova župnišča in ureditev okolice sta predvideni za naslednjo fazo urejanja. Da bi zaokrožili podobo tabora, smo temelje začasno vizualno nakazali z linijo kamnov, položenih v peščeno posteljico. Prezentacija je umeščena v okolje, ki se je od časov nastanka tabora do danes zelo malo spremenilo. Domnevamo, da je tabor tudi takrat stal na robu majhnega naselja v dolini, sredi obdelovalnih površin. Turki so imeli neoviran dostop do tabora z vzhodne strani po Mirnopeški dolini. Relief se južno od tabora oziroma cerkve postopoma dviguje proti Golobinjeku, na severozahodu proti Sv. Ani, na severu pa proti gričevju, ki ločuje Mirnopeško in Šentjursko dolino.

Pri prezentaciji smo zasledovali cilj, da sta interpretacija in predstavitev del splošnega procesa ohranjanja kulturne dediščine. Upoštevali smo načela, ki jih predlaga Icomosova listina o interpretaciji in predstavitvi območij kulturne dediščine (Doktrina, 2014: 48–53).

1. Načelo dostopnosti in razumevanja

Prezentacija omogoča pogled v zgodovino. Protiturški tabori sodijo med kmečko arhitekturo, ki je po krivici prezrta. Na območju novomeške enote sta prezentirana tabora v Mirni Peči in Semiču, ostaline pa so odkrili še v Trebnjem in Dolenjskih Toplicah.

2. Načelo virov informacij

Linija tabora in stolp sta bila izkopana in dokumentirana po načelih arheološke stroke. Rezultate smo upoštevali pri pripravi načrta za prezentacijo in pri izvedbi prezentacije.

3. Načelo konteksta in okolice

Novoodkrite ostaline dodajajo vsebino novi ureditvi ploščadi okrog cerkve. Potrjujejo ustno izročilo, ki je močno prisotno v lokalni skupnosti. So hkrati spomin in opomin. Odkritje slovanskega grobišča iz 10. do 11. stoletja pa vsaj deloma pojasnjuje, zakaj je bila v Mirni Peči ustanovljena ena izmed najstarejših župnij na Dolenjskem.

4. Načelo ohranjanja avtentičnosti

Temelji so dobro ohranjeni, čeprav so ponekod uničeni z novodobnimi posegi. Prikazana je linija tabora, potrjena z arheološko raziskavo. Pod pohodnim steklom so prezentirani temelji starejše gradbene faze, ki jih je Vancaš ob zidavi nove cerkve vrisal kot stransko kapelo ob gotskem prezbiteriju.

5. Načelo trajnostnega načrtovanja

Prezentacija in vedenje o najdišču bosta vključena v lokalno skupnost. Najdišče leži ob najbolj obljudenih točkah v Mirni Peči, ob cerkvi in nasproti trgovine. Območje leži na ravnini, brez višinskih nivojev je zasnovana tudi prezentacija, zato je lahko dostopna tudi gibalno oviranim osebam in invalidom. Kot eno izmed dopolnilnih vsebin bi ga lahko vključili v muzej Lojzeta Slaka in Toneta Pavčka. Infrastrukturne vode so prestavili in položili tako, da najdišče in prezentacija ob popravilih ne bosta poškodovana. Informativno tablo smo, da bi se izognili dodatnim posegom v tla na območju grobišča, pritrdili na ulično svetilko, ki tablo hkrati tudi osvetljuje.

6. Načelo vključevanja različnih dejavnikov

Prezentacija je rezultat sodelovanja Zavoda za varstvo kulturne dediščine Slovenije, OE Novo mesto, projektivnega biroja Struktura, d. o. o, izvajalca gradbenih del Gradbeništvo in prevozi A. Kregl, s. p,, in župnika J. Rihtaršiča. Kljub različnim mnenjem smo po konstruktivnih pogovorih večinoma dosegli konsenz. ZVKDS je zagovarjal dokumentirana dejstva, projektant in arhitekt pa ilustrativno svobodo.

7. Načelo raziskovanja, usposabljanja in ocenjevanja

Ves čas arheoloških raziskav in tudi prezentacije smo z obveščanjem v lokalnih medijih sodelovali z lokalno skupnostjo. Ob najdišču stoji informativna tabla z osnovnimi podatki. Podatki o najdišču se bodo dopolnjevali z raziskavami v naslednjih dveh načrtovanih gradbenih fazah.

Velik problem prezentiranih arheoloških spomenikov *in situ* je vzdrževanje. Vzdrževanje je v tem kontekstu mišljeno kot čiščenje, vzdrževanje in obnavljanje propadajočih delov znotraj pooblastil. Nanj vplivata zavest lokalne skupnosti, ali ji je uspelo poistovetiti se s spomenikom, pa tudi oddaljenost od urbanih središč (Sagadin, 2014; Bratina, 2014). Obravnavana prezentacija leži v središču Mirne Peči ob cerkvi, zato bo za vzdrževanje poskrbela župnija. Naklonjena ji je tudi lokalna skupnost.

Popularizacija

Rezultate arheoloških raziskav smo objavili v občinskem glasilu. Novico sta objavili tudi spletna in tiskana različica Dolenjskega lista. Arheološke raziskave so potekale poleti 2016, v času t. i. kislih kumaric, zato je bil prispevek objavljen na spletnih straneh RTV Slovenija (16. 8. 2016, https://www.rtvslo.si/kultura/drugo/arheoloski-najdbi-v-mirni-peci-protiturska-utrdba-in-slovansko-grobisce) in tudi v osrednjem televizijskem dnevniku (19. 8. 2016). Po zaključku raziskav smo na povabilo župnika predstavili kulturno dediščino mirnopeške občine, zgodovino in razvoj taborov ter rezultate arheoloških raziskav.[10] Predstavitvi je sledilo strokovno vodstvo po najdišču. Predstavitve in vodstva se je udeležilo veliko število ljudi. Junija 2017 ob koncu del oziroma ob obletnici posvetitve cerkve je Župnija Mirna Peč izdala publikacijo z naslovom 100-letnica posvetitve župnijske cerkve v Mirni Peči. Ob lokaciji stoji tudi informativna tabla s podatki o najdišču, žal samo v slovenskem jeziku. Entuziastični arheologi iz Magelan skupine so predlagali tudi izdelavo QR-kode, ki bi najdišče približala navdušencem za tehnologijo. Na ta način bi lahko podali več informacij ter grafičnih in fotografskih prilog. V arhivski dokumentaciji arheološkega najdišča so tudi 3D-posnetki, ortofoto posnetki in pa videoposnetki izkopavanja, posneti z dronom.

Prezentacije na prostem v Sloveniji

V Sloveniji je bilo na prostem do leta 2012 *in situ* prezentiranih 44 arheoloških najdišč iz različnih obdobij, različne velikosti ter z različnim razvojnim potencialom. Podrobneje jih je ovrednotila A. Breznik (Breznik, 2012: 174–183; 309–349). Med bolje ohranjene in zdaj obnovljene protiturške tabore uvrščamo tabor na Cerovem pri Grosupljem (Fister, 2006: 70–71). V nadaljevanju bomo predstavili najnovejše prezentacije iz obdobja srednjega veka na območju novomeške enote ZVKDS. Del protiturškega tabora so leta 2014 prezentirali v Semiču, del je še ohranjen v kompleksu cerkvenih stavb. Ohranjena je dvojna linija obzidja. Okrogla stolpa in povezovalni liniji zidu so pred vhodom v cerkev v dveh višinskih nivojih prezentirali v tlaku. Za prikaz stolpov in zidov so uporabili granit, ki izstopa od okolice, prav tako bi bila lahko vsaj nakazana povezava stolpa s preostalim obzidjem. Pod pokrovom iz granita je še ohranjen in viden originalni zid jugozahodnega stolpa (slika 11). V istem letu so na novomeškem Kapiteljskem hribu obnovili razpadajoče mestno obzidje, znano kot Šance. Srednjeveško obzidje z obrambnimi stolpi oziroma taborski kompleks je prezentiran v sklopu obnovljenega gradu Vinica (Omahen in Britovšek, 2018: 278). V Dolenjskih Toplicah sta se v sklopu cerkvenih stavb ohranila južni zid tabora s strelnimi linami in jugozahodni stolp (Peskar, 2015: 174). Arheologi so ob sanaciji temeljev severnega vogala župnišča dokumentirali in izkopali ovalni stolp protiturškega tabora, ki so ga po končanih delih zasuli (Peterle Udovič, 2014: 50–51). Na Otoku pri Dobravi so na območju srednjeveškega oziroma freisinškega trga *Gutenwerd*, tudi *Gutenwerth*, pod slamnato streho prikazane ostaline cerkve sv. Mihaela. *Gutenwerd* so leta 1473 uničili Turki. V Novem mestu je ena zadnjih prezentacij na prostem. V tlaku so prikazali srednjeveško cesto in del dolenjih mestnih vrat (slika 12).

10 Predstavitvi sta imela konservatorka mag. Katarina Udovč z ZVKDS in arheolog Rok Bremec iz takratne Magelan skupine.

Zaključek

Evidentiranje slovanskega grobišča iz 10. do 11. stoletja v Mirni Peči ob cerkvi sv. Kancijana dopolnjujeta kontekst pražupnijskih središč in poselitvena slika, hkrati pa vsaj deloma pojasnjuje, zakaj so tu ustanovili prafaro. Več odgovorov bomo dobili po končanih arheoloških izkopavanjih grobišča. Grobišče je za zdaj edino znano arheološko najdišče v Mirnopeški dolini.

V Sloveniji je do konca 15. stoletja zaradi obrambe pred Turki nastala sistematično razporejena mreža 350 do 400 taborov vseh mogočih oblik. Do dandanes se jih je v celoti ohranilo le nekaj, največ na Koroškem. Večina taborov je izginila po dolgotrajnem propadanju šele v 18. in 19. stoletju (Fister, 2006: 34). Nekaj bolje ohranjenih taborov so obnovili, npr. Cerovo nad Grosupljem, Šmarno goro, ponekod so deli obzidja ohranjeni v kompleksih cerkvenih stavb, npr. Semič, Dolenjske Toplice, Cerknica. Od tabora v Mirni Peči so se ohranili temelji, ki smo jih izkopali in dokumentirali med arheološkimi raziskavami. Čeprav sledi na površini niso bile vidne, se je spomin na tabor ohranil v ustnem izročilu. Temelji srednje velikega mirnopeškega protiturškega tabora z začetka 16. stoletja so prezentirani v tlaku *in situ*. Z rekonstrukcijo in prezentacijo tabora smo zaključili tam, kjer bi se zaradi neohranjenosti začela domišljija. Dodana vrednost današnje prezentacije je tudi okolje, ki se je od nastanka tabora do danes zelo malo spremenilo. Tabor leži na robu naselja in ga s treh strani tako kot v času nastanka obdajajo polja in reka Temenica. Takrat je bil eden izmed mnogih, danes pa predstavlja enega redkih, vsaj v temeljih ohranjenih in v tlaku prikazanih taborov ter kot tak pomaga ustvarjati in razumeti podobo pokrajine v težkih časih 15. in 16. stoletja.

Literatura

BRATINA, P. (2014): Kako upravljamo z arheološkimi spomeniki v zahodni Sloveniji. – ARHEO 31, 185–193.

BREZNIK, A. (2012): Upravljanje arheološkega parka RS. – Doktorska disertacija. Dostopna na: http://dk.fdv.uni-lj.si/doktorska_dela/pdfs/dr_breznik-andreja.PD.

BRITOVŠEK, T., in KOVAČ, O. (2017): Semič – območje tabora, Semič – cerkev sv. Štefana, Semič – trško jedro. – *Varstvo spomenikov, poročila* 52, 205–207.

DAMJANOVIĆ, D. (2014): Neogotička arhitektura u opusu Josipa Vancaša. Radovi u Italiji, Hrvatskoj in Sloveniji. Neo-gothic Architecture in Josip Vancaš' s Work projects in Italy, Croatia and Slovenia. – *Prostor 22, Znanstveni časopis za arhitekturo in urbanizem. A schoolarly journal of architecture and urban planning*, Zagreb.

Djokić, S., in Rozman, L. (2016)*: Končno strokovno poročilo o arheoloških raziskavah v sklopu zunanje ureditve okolice sv. Kancijana v Mirni Peči. Kranj, neobjavljeno poročilo.*

DOLINAR, F. M. (1993): Prošti novomeškega kapitlja: 1493–1993. Novo mesto: Dolenjska založba.

DRAŽUMERIČ, M., in BRITOVŠEK T. (2014): Semič protiturški tabor. – Zloženka ZVKDS.

FISTER, P. (1975): *Arhitektura slovenskih protiturških taborov. Ljubljana: Slovenska matica.*

Fister, P. (2003): Varovanje kulturne dediščine kot nova vrednota. – V: *Doktrina* 1 (ur Grobovšek, J.), 11–14. Ljubljana: Združenje ICOMOS/SI.

FISTER, P. (2006): Tabor nad Cerovim pri Grosuplju. V: *Gradovi, utrdbe in mestna obzidja: vodnik po spomenikih*. Dnevi evropske kulturne dediščine (ur. Gorenc, N.), 70–71.

FISTER, P. (2006): Protiturški tabori na Slovenskem. V: *Gradovi, utrdbe in mestna obzidja: vodnik po spomenikih*. Dnevi evropske kulturne dediščine (ur. Gorenc, N.), 33–40.
HÖFLER, J. (2016): *O prvih cerkvah in župnijah na Slovenskem. Ljubljana: Viharnik.*

JUG, S. (1943): Turški vpadi na Kranjsko in Primorsko do prve tretjine 16. stoletja.

Kronologija, obseg in vpadna pota. V: Glasnik Muzejskega društva za Slovenijo, XXXIV, 1–4, Ljubljana, 1–61.

Kovač, O. (2014): *Strokovno poročilo o predhodni arheološki raziskavi – arheološka raziskava ob gradnji na delu parcel št. 615/8 in 615/7, k. o. Mirna Peč, občina Mirna Peč. – Neobjavljeno poročilo.*

MASON, P. (1999): Arheološko najdišče Črnomelj. V: Kulturne poti: vodnik po spomenikih. Dnevi evropske kulturne dediščine (ur. Batič, J.), 33–41.

Mason, P. (2018): The Empty Quarter: the Early Medieval period in south-eastern Slovenia in the light of recent research. V: *Vestnik XXVII, Slovani, naša dediščina (ur. Lux, J. , Štular, B., in Zanier, K.)./Our Heritage: the Slavs (ed. by Lux J. , Štular B. in K. Zanier)*, 91–102.

PIRKOVIČ, J. (1993): *Osnovni pojmi in zasnova spomeniškega varstva v Sloveniji.* – Vestnik 11.

OMAHEN, M., in BRITOVŠEK, T. (2018): Vinica – arheološko najdišče ob gradu, Vinica – grad. – *Varstvo spomenikov, poročila* 53, 275–278.

PIRKOVIČ, J. (2012): *Arheološko konservatorstvo in varstvo nepremične kulturne dediščine: učbenik za predmet Arheologija za javnost. Ljubljana: Znanstvena založba Filozofske fakultete Univerze v Ljubljani. Dostopno na: https://e-knjige.ff.uni-lj.si/znanstvena-zalozba/catalog/download/101/193/2562-1?inline=1.*

PESKAR, R. (2015): Župnijska cerkev sv. Ane in nekdanji tabor. – Dolenjske Toplice v odsevu časa (ur. Peskar, R.), 153–179.

PETERLE UDOVIČ, P. (2014): Dolenjske Toplice – župnišče in Dolenjske Toplice – vaško jedro. – *Varstvo spomenikov, poročila 49, 50–51.*

PETRIČ, M. (2000): Mednarodno pravno varstvo kulturne dediščine. Ljubljana: Ministrstvo za kulturo, Uprava RS za kulturno dediščino.

PETRU, P. (1974): Blejski otok urejen. – Varstvo spomenikov XVII–XIX/1, 79–84.

PUST, A. (ur.) (1987): Mirna Peč z okolico nekoč in danes. – Župnijski urad v Mirni Peči.

SAGADIN, M. (2014): (Ne)upravljanje arheoloških spomenikov na Gorenjskem. – ARHEO 31, 177–185.

*PLEMIĆ, B. 2018: Rimski ostaci u tržnom centru „Rajičeva": Nova turistička atrakcija Beograda ili primer devastacije arheološkog nasleđa? Roman Remains in Rajićeva shopping centre: A new turist attracton in Belgrade or a case study in devastation of cultural heritage? – Turisticko Poslovanje 21, 5–12 (doi:*10.5937/TurPos1821005P).

Struktura (Slak, J.) (2016): *PGD, A-1520*. Novo mesto.

Udovč, K., in Rozman, L. (2017): Mirna Peč – *Arheološko najdišče sv. Kancijan in Mirna Peč – Cerkev sv. Kancijana. – Varstvo spomenikov, poročila 52, 147–148.*

Udovč, K. (2018): Mirna Peč – Arheološko najdišče sv. Kancijan in Mirna Peč – Cerkev sv. Kancijana. – *Varstvo spomenikov, poročila 53, 156–159.*

Verbič, T. (2016): *Poročilo o georadarski raziskavi ob cerkvi sv. Kancijana v Mirni Peči. –Neobjavljeno poročilo.*

VOJE, I. (1996): Slovenci pod pritiskom turškega nasilja. – Znanstveni inštitut Filozofske fakultete, Ljubljana.

Franciscejski kataster za Kranjsko, Arhiv Republike Slovenije. http:// *www.arhiv.gov.si.*

Listine in zakoni

Burrska listina – Listina iz Burre – Listina avstralskega ICOMOS-a za ohranjanje prostorov s kulturnim pomenom/ Burra Charter. The Australia ICOMOS charter for places of cultural significance. Burra, 1999, ICOMOS – Avstralski nacionalni odbor. http://australia.icomos.org/burra.html.

ICOMOS. 1964. Mednarodna listina o konservaciji in restavraciji spomenikov in spomeniških območij (Beneška listina). – V: *Doktrina 1. Mednarodne listine ICOMOS, ur. Jovo Grobovšek, 2003, 25–8. Ljubljana: Združenje ICOMOS/SI.*

ICOMOS. 1990. Listina o varovanju in upravljanju arheološke dediščine (Lausannska listina). 2003. – V: Doktrina 1. Mednarodne listine ICOMOS, ur. Jovo Grobovšek, 2003, 45–50. Ljubljana: Združenje ICOMOS/SI.

ICOMOS. 2008. Listina o interpretaciji in predstavitvi območij kulturne dediščine (Quebec). – V: *Doktrina 2/ Mednarodne listine in dokumenti. Doctrine 2/ICOMOS International Charters and Documents,* ur. Grobovšek, Jovo, Oven, Maja, in Šeme, Blaž, 2014, 48–53.

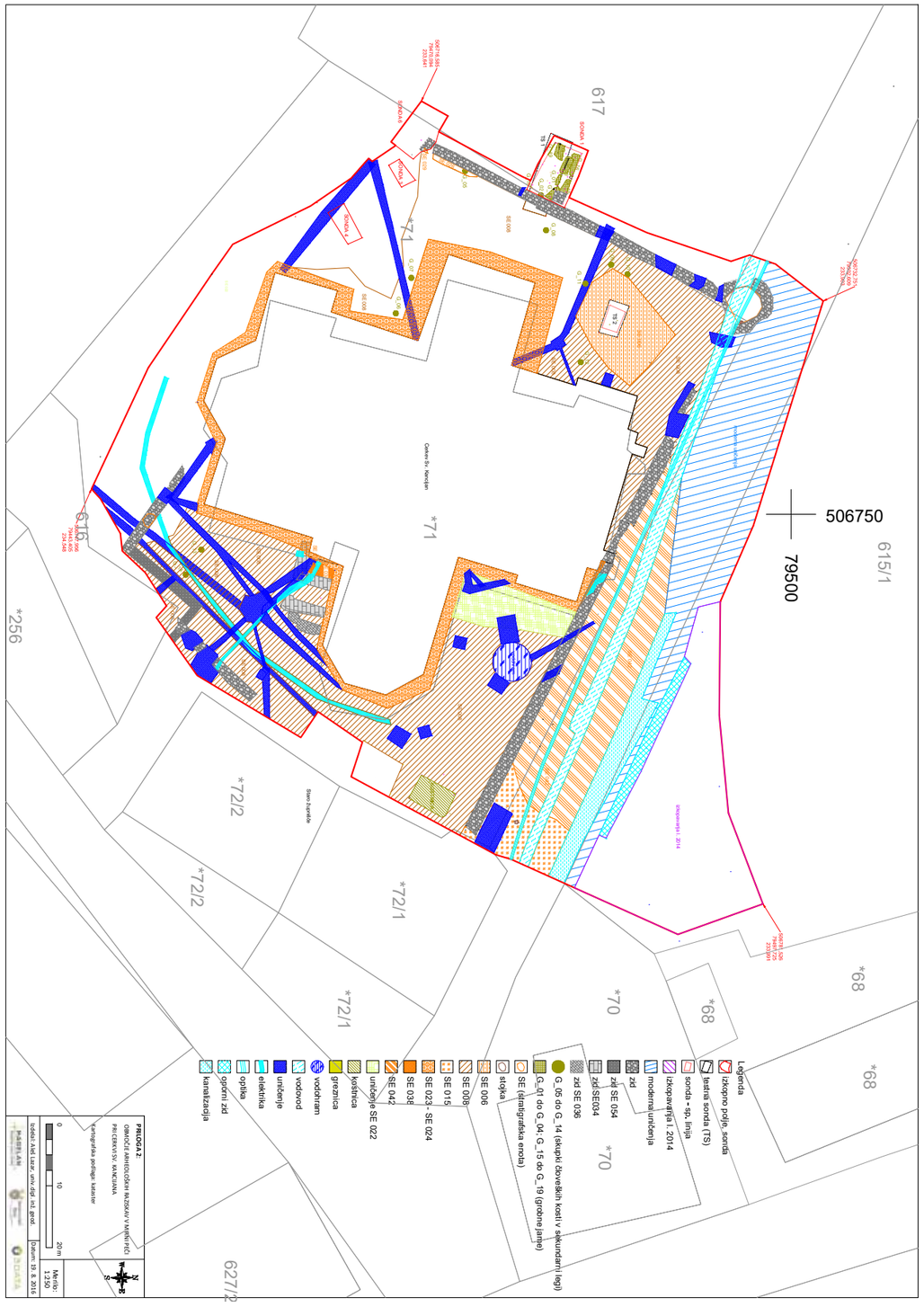
Malteška konvencija – Zakon o ratifikaciji Evropske konvencije o varstvu arheološke dediščine (spremenjene) (MEKVAD). Uradni list RS, št. MP 7/99. /The European Convention on protection of archaeological heritage (revised). La Valetta, 1992, Svet Evrope – Council of Europe.

Odlok o razglasitvi naravnih znamenitosti in nepremičnih kulturnih in zgodovinskih spomenikov v občini Novo mesto. – Uradni list RS, št. 38/92-1927.

Zakon o varstvu kulturne dediščine (ZVKD-1). – *Uradni list RS, št. 16/08. Ljubljana.*

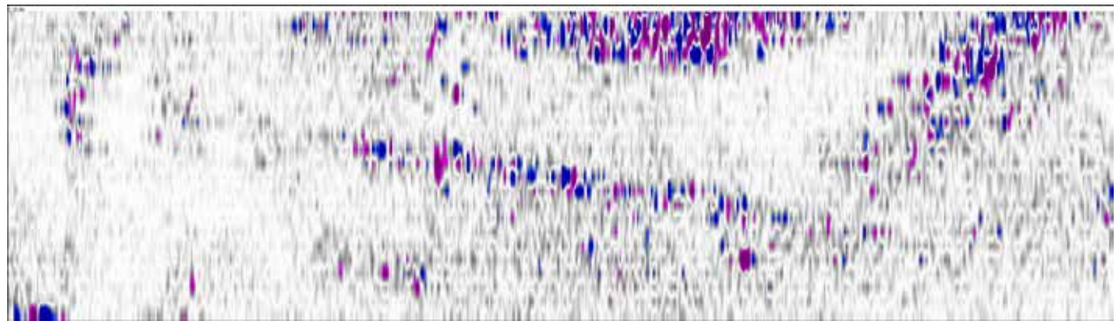
1. Okolica župnijske cerkve sv. Kancijana v Mirni Peči pred ureditvijo (foto: R. Bremec, Magelan skupina)
1. The surroundings of the Parish Church of St Cantianus and Companions in Mirna Peč before the renovation (photo: R. Bremec, Magelan Skupina)

2. Mirna Peč, upodobljena v franciscejskem katastru; listi SIAS176/N/N94/gAO2–O4
2. Mirna Peč, as shown in the Franciscan cadastral survey; sheets SIAS176/N/N94/gAO2–O4



3. Kompozitni tloris arheološkega najdišča sv. Kancijan (EŠD 30348) s prikazanimi infrastrukturnimi vodi (modre barve) in vrisanimi arheološkimi sondami (izdelal: A. Lazar, Magelan skupina)

3. Composite ground plan of the St Cantianus Archaeological Site (EŠD 30348) showing infrastructure cable conduits (in blue) and with archaeological test trenches drawn in (plan drawn by: A. Lazar, Magelan Skupina)

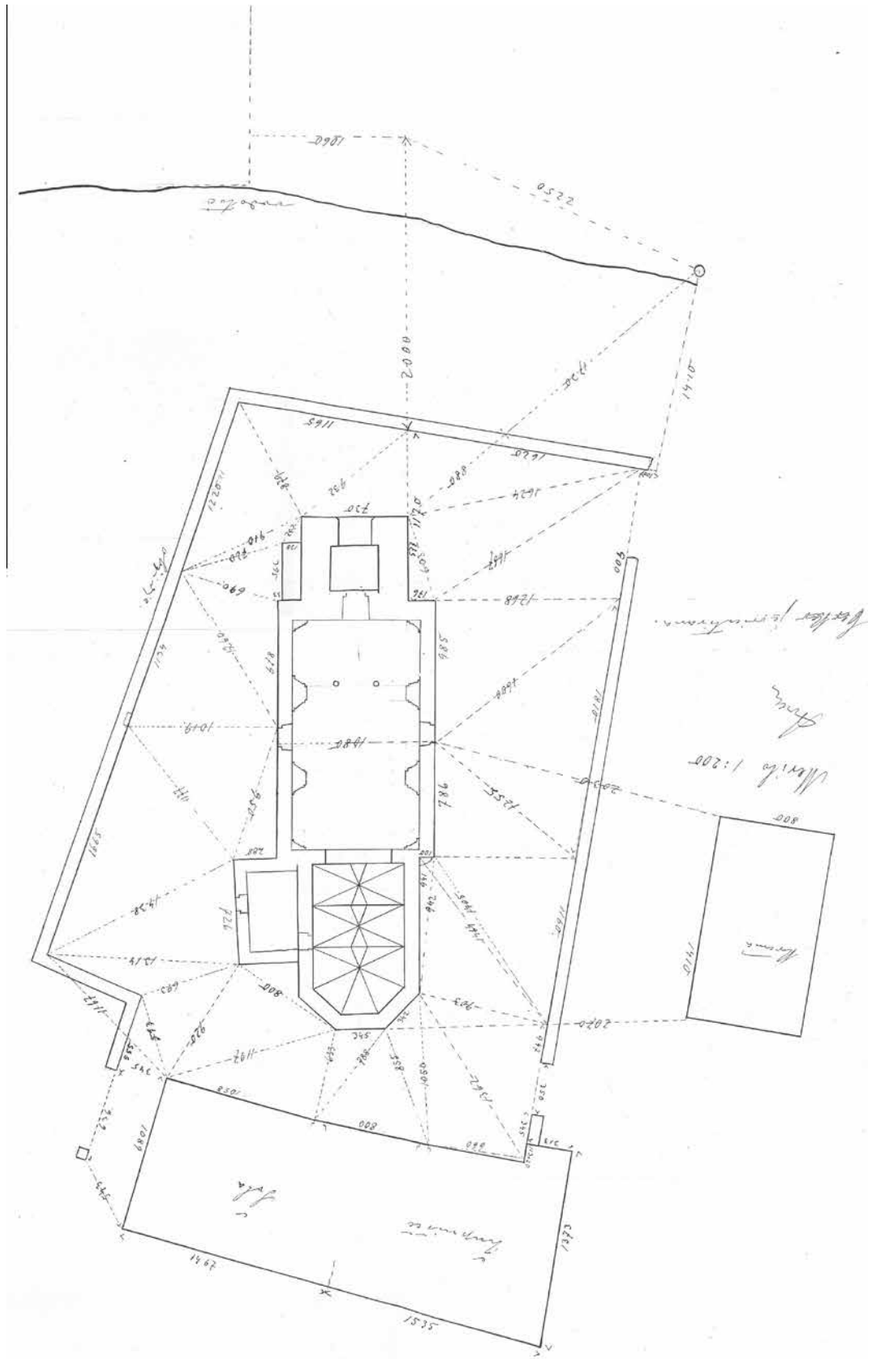


4. Prikaz rezultatov georadarskih raziskav na zahodnem delu. Prepoznajo se linearna linija – temelji in okrogla struktura – stolp (izdelal: T. Verbič).

4. Presentation of results of GPR investigation in the western part of the site. A linear line (foundations) and a round structure (a tower) can be recognised (prepared by: T. Verbič).

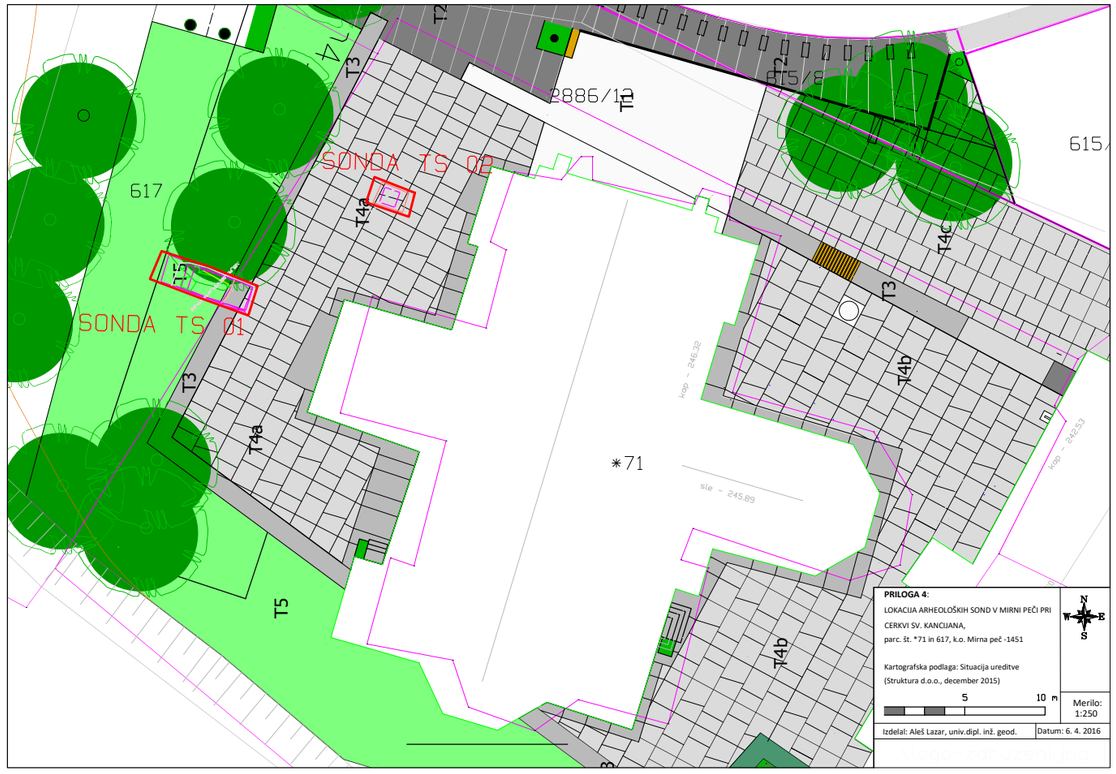
5. Pogled na ohranjene temelje protiturškega tabora, župnijsko cerkev sv. Kancijana in okolico (foto: R. Bremec, Magelan skupina)

5. View of the conserved foundations of the tabor, the Parish Church of St Cantianus and Companions and the surrounding area (photo: R. Bremec, Magelan Skupina)



6a. Taborsko obzidje okrog srednjeveške cerkve, izrisano pred povečanjem cerkve (hrani: Zgodovinski arhiv Ljubljana, SI_ZAL_NME/003, Okrajno glavarstvo Novo mesto, Cerkev v Mirni Peči – načrt)

6a. The tabor wall around the medieval church, drawn before the enlargement of the church (kept by: Historical Archives of Ljubljana, SI_ZAL_NME/003, Novo Mesto District Captaincy, Church in Mirna Peč – plan)



6b. Prvotna idejna zasnova prezentacije z vrisano lego sond (izdelala: Struktura 2015 in A. Lazar, Magelan skupina)

6a. First draft design of the presentation showing the position of the test trenches (prepared by: Struktura 2015 and A. Lazar, Magelan Skupina)

7. Končna idejna zasnova prezentacije, dopolnjena z novoodkritim stolpom (izdelala: Struktura 2016)
7. Final design of the presentation supplemented by the newly discovered tower (prepared by: Struktura 2016)

8a. Z infrastrukturnimi vodi poškodovan stolp (foto: K. Udovč, ZVKDS, CPA)
8a. Tower damaged by infrastructure cable conduits (photo: K. Udovč, ZVKDS, CPA)

8b. Rekonstrukcija pozidave stolpa (foto: K. Udovč, ZVKDS, CPA)
8b. Reconstruction of the stonework of the tower (photo: K. Udovč, ZVKDS, CPA)

9. Pod steklom prezentirani temelji srednjeveške cerkve (foto: K. Udovč, ZVKDS, CPA)
9. The foundations of the medieval church presented under glass (photo: K. Udovč, ZVKDS, CPA)

10. Župnijska cerkev sv. Kancijana, prezentiran protiturški tabor in manjši trg po prenovi v Mirni Peči (foto: F. Aš, ZVKDS, OE Novo mesto)
10. The Parish Church of St Cantianus and Companions, the presented tabor and the small square following renovation in Mirna Peč (photo: F. Aš, ZVKDS, Novo Mesto Regional Unit)

11. Prezentacija taborskega obzidja s stolpi pred vhodom v župnijsko cerkev sv. Štefana v Semiču (foto: F. Aš, ZVKDS, OE Novo mesto)
11. Presentation of tabor wall with towers in front of the entrance to the Parish Church of St Stephen in Semič (photo: F. Aš, ZVKDS, Novo Mesto Regional Unit)

12. Prezentacija *in situ* dela dolenjih mestnih vrat na Pugljevi ulici v Novem mestu (foto: mag. U. Bavec, ZVKDS, OE Novo mesto)
12. Presentation in situ of part of the lower town gate on Pugljeva Ulica in Novo Mesto (photo: U. Bavec, ZVKDS, Novo Mesto Regional Unit)

Katarina Udovč

Presentation of the tabor wall around the Church of St Cantianus and Companions in Mirna Peč

Professional article
COBISS 1.04

UDC
726:903/904(497.4Mirna Peč)

Keywords: ancient parish, Slavonic burial ground (10th–11th century), tabor, presentation *in situ*

Abstract

Preliminary archaeological investigations carried out during renovation of the area around the church in 2016 uncovered a Slavonic burial ground dating from the tenth to the eleventh century. This discovery at least partially explains why one of the oldest parishes in the country was established in Mirna Peč. Around the church, the foundations of a moderately sized early-sixteenth-century tabor – a fortification built as a defence against Ottoman raids – and part of a medieval church, most likely a side chapel, were documented and excavated. The foundations of the tabor are presented *in situ* in the pavement itself, while the foundations of the church are presented below a glass pavement. We will set out the arguments that persuaded us to choose these types of presentation and list the recommendations and principles from international documents that we followed.

Introduction

Mirna Peč is one of the smaller and more recently established municipalities in Slovenia's south-eastern Dolenjska region and one of the oldest parishes. It borders the municipalities of Trebnje, Novo Mesto, Straža, Žužemberk and Mokronog–Trebelno. The municipality of Mirna Peč consists of three valleys: Mirna Peč Valley (Mirnopeška dolina), Globodol (Globodolska dolina) and Šentjurij Valley (Šentjurska dolina). Towards the end of 2015, the Parish of Mirna Peč launched a project aimed at rearranging the area around the parish church. The reason for this was the upcoming celebration of the centenary of the church's consecration in 2017. Until 2014, access to the church had been from the local Mirna Peč–Dobrnič road across a sandy, grassy area (Fig. 1). Oral tradition conserved the memory of a tabor (built as a refuge for the local population during Ottoman raids), so it was decided to give additional value to the new arrangement of the area around the church by presenting it. We will discuss this presentation in the light of questions surrounding reconstructions of archaeological heritage, open-air presentations and communication.

Creation of the parish and the tabor

The first recorded archaeological site in the vicinity of Mirna Peč is on the hill known as Sveta Ana (St Anne), which closes Mirna Peč Valley to the north, at the border with the neighbouring municipality of Trebnje. An area comprising a prehistoric hill fort, a mound burial site and a flat burial site has been proclaimed a cultural monument of local importance, together with St Anne's Church (UL RS 38/92). No archaeological sites had been recorded in Mirna Peč Valley before 2016.

Katarina Udovč, Institute for the Protection of Cultural Heritage of Slovenia, katarina.udovc@zvkds.si

One of the oldest ecclesiastical parishes in Slovenia, a so-called original or ancient parish, was established in Mirna Peč. The Parish of St Cantianus and Companions in Mirna Peč already existed in the first half of the twelfth century and pertained *pleno iure* to the Patriarchate of Aquileia. In all probability, it was established during the parochial reform carried out in the second half of the eleventh century. It is possible, however, that it is even older. A parish priest is mentioned for the first time in 1228, while the parish itself is mentioned as a *plebs* in 1274. It is also mentioned in the pontifical tithes register from 1296. The church's patronage betrays the influence of Aquileia. After the Church of St Cantianus and Companions in Kranj, the church is the oldest with this patronage in Slovenia. In 1495 the Parish of Mirna Peč was incorporated into the newly established collegiate chapter in Novo Mesto (Höfler, 2016: 289). Since 2006 the parish has been part of the Diocese of Novo Mesto. The medieval church, dedicated to St Cantianus and Companions, is first mentioned in 1526. By the end of the nineteenth century the church had become too small and plans to build a new church or enlarge the old one began to be put forward. In 1908 plans for the new church were drawn up by the architect Josip Vančas. The new church, in neo-Gothic style, was built during the First World War (between 1914 and 1915) and consecrated in 1917. Since the old nave was demolished and a new one built perpendicular to it, the old *presbyterium* (sanctuary) was preserved, today serving as a side chapel. The bell tower was also preserved. (Damjanović, 2014: 263; Pust, 1987: 40–43). The old Gothic sanctuary with its rib vault supported by geometric corbels is a good example of late Gothic architecture and was therefore proclaimed a cultural monument of local importance in 1992 (UL RS 38/92); the *tabor* is not mentioned in the ordinance. It is thought that the sanctuary of the medieval church incorporated stones from an older, Romanesque church. The bell tower was repaired and increased in height in 1996. While the medieval church had an east–west orientation, the new church was built on a north–south axis. The old church measured approximately 8 x 27 m up to the bell tower, while the new part measured 34 x 17 m.

The *tabor* was one of various types of fortification built by ordinary people around Slovenia to serve as a refuge in times of military danger or during plundering expeditions. Such fortifications were used as permanent or temporary storage for provisions, livestock and church valuables. They are evidence of an original concept of defence against Turkish raids that was adopted by the rural population. *Tabor* construction flourished in the fifteenth and sixteenth centuries. For the local population they were part fortification and part social gathering place (Fister 1975: 7–9). Since there was no fortified building in Mirna Peč Valley where the population could take refuge from the Turks, in around 1500 the future Bishop of Vienna Jurij Slatkonja sought permission from Emperor Maximilian to build a fortification (*tabor*) around the church (Dolinar, 1993: 15). Turkish raids on Slovene territory began after 1400, although the bulk of the plundering expeditions took place following the Ottoman conquest of Bosnia, in other words after 1463. Between 1469 and 1483, the Turks raided Slovene territory almost every year, sometimes several times a year, carrying off plunder and laying waste to the countryside. One of the Turks' main routes towards the west ran through the Bela Krajina region in the south-eastern corner of present-day Slovenia. In 1471 the Turks burnt down the charterhouse of Pleterje. In 1473 they were in the environs of Novo Mesto, Mirna Peč and Trebnje, returning there in 1476 before moving upstream along the valley of the Krka. In 1491, 1493 and 1511, they came to the Soteska area. In 1528 they were once again in the area around Mirna Peč and Trebnje (Jug, 1943: 12–61; Voje, 1996: 33). The *tabor* wall with granary, towers and church was sketched in 1603 or 1604 by the cartographer Ivan Klobučarić (Fig. 2). The sketch shows round towers in the NW and SW corners, a square tower in the NE corner and a square structure that could either be a granary or the old presbytery (priest's house), as well as walls pierced with loopholes. Fister interpreted the square structure as a granary (Fister 1975: 85). A presbytery and school were later built on the site of the square tower and the other square structure. The date 1777 appears above the front door of the presbytery.[1]

Preliminary archaeological investigations and findings

In around 1825 the church cemetery was moved to its present location, on a hill to the south-east of Mirna Peč (Pust 1987: 56). The location of the new cemetery is shown in the Franciscan cadastral survey. The location of the old cemetery by the church is recalled by the traditional name of the large meadow to the west of the church, between the local road leading towards Dobrnič and the Temenica river – "Za Britofom", literally "behind the graveyard" (Fig. 2). The cemetery was damaged several times by building work: first during construction of the *tabor* and then by the building of the presbytery, school and church during the First World War. During the Second World War, Italian soldiers dug trenches in this area, coming upon the foundations of a powerful wall in the process. The church was hit by a number of grenades during the war and suffered some damage. Recent interventions that have degraded the area of the cemetery include excavations for infrastructure cables, storm sewers, street lighting, electricity cables and lightning conductors (Fig. 3). The suggestion regarding the presentation of the remains was a welcome one, given that the majority of interventions to date have taken place without archaeological investigations, despite these being envisaged by the protection regime.

In order to verify the condition and extent of the *tabor* walls, the Institute for the Protection of Cultural Heritage of Slovenia (ZVDKS) included examination of the area using ground-penetrating radar (GPR) in the cultural protection conditions.[2] Our research included sites from parcel numbers *71, 616, 617 and part of 2886/12, all in the Mirna Peč cadastral district. At shallower depths, GPR echoes are unclear to a depth of 0.95 m, which confirms that archaeological strata and structures were damaged by the interventions mentioned earlier. GPR echoes allowed the documentation of multiple linear structures and one round structure (Fig. 4) (Arhej, 2016). The echoes were then verified by an invasive archaeological investigation – the excavation of two archaeological test trenches – in order to determine the content and structure of the site. The archaeological investigations were led by L. Rozman of the Kranj-based company Magelan Skupina d.o.o. Mortar-bound foundations between 0.8 m and 1 m wide and reaching down to a depth of up 1.30 m were discovered 0.30 m below the current ground level in the test trench dug to the west of the church. While the discovery of the foundations was no surprise, we were surprised by the discovery of a Slavonic burial ground. We discovered the latter below the foundations of the *tabor*, at a depth of 1.7 m below the current ground level. Two early medieval graves were excavated in an area of 15 m^3, while a further eight were documented.[3] Archaeological excavation of the burial site (the estimated area of which is 350 m^3) have not yet been carried out, since this would exceed the developer's currently planned budget. No building work was carried out in the area of the burial ground in this phase either. Excavation will have to take place before the arrangement of an emergency access route and repairs to the retaining wall on the south side. The graves had an east–west orientation and were dug into the bedrock. A few skull bones and fragments of long bones have survived of both skeletons. Finds excavated from the two graves consisted of a bronze cluster earring with a wire bow, cast bronze bands and a silver ring found alongside a right tibia. Judging from these finds, the burial ground dates from the eleventh century. Human bones in a secondary position were dug up at a depth of 0.6 m in a test trench nearer the church, in the area of a medieval and early modern burial ground (Udovč, Rozman, 2017: 147–148). Elsewhere in the Dolenjska region, graves dating from the tenth to eleventh centuries that could be related to the formation of early medieval parishes have been excavated in Bela Cerkev, Trebnje, Tržišč and Šentrupert (Mason, 2018: 93–94, Fig. 4).

In the eastern part, between the church and the presbytery, an oval pit filled with human bones was unearthed during the archaeological documentation process that coincided with the construction process. Our assumption is that this pit was used to bury bones from graves that had been dug up or from graves destroyed during building work in the past. The pit was documented and filled in. Bones dug up during building work at that time are believed to have been buried in the present-day cemetery.

The *tabor*

The Mirna Peč *tabor* had an irregular quadrilateral, almost trapezoidal shape. It may be considered a medium-sized *tabor*, with its shorter sides measuring approximately 27 m and its longer sides measuring 45 m. The foundations were best preserved on the west and north sides (Fig. 5). On the south side they were largely destroyed by the construction of the sanctuary of the new church, while on the east side the foundations continue below the parish priest's house or presbytery. Because of the method of construction employed, the foundations vary in width. The width of the west wall ranges from 0.75 to 1.1 m, while the south wall is around 0.8 m thick. The *tabor* walls were built by laying the outer and inner walls without shuttering, while the gap between them was filled with rubble and quicklime mortar. The latter was also used to bind the undressed, rough stones of the wall (Fister, 1975: 38–40). Of the two round towers shown in Klobučarić's sketch, only the foundations of the NW tower have survived. This tower had an internal diameter of 3.1 m, making it smaller than the defence towers of other *tabor*-type fortifications. The towers in Semič had diameters of 6.15 m and 6.95 m respectively (Dražumerič, Britovšek, 2014; Britovšek, Kovač, 2017: 207). During our archaeological investigations, we dug more deeply at a location corresponding to the SW junction of the foundations, where, according to the sketch, the other tower could have stood, but we did not find any foundations. These would have been directly alongside the retaining wall, so it is possible they were removed during construction. The relevant literature states that crumbling walls still surrounded the church up to the year 1856 (Pust, 1987: 36). The ruins of the walls were used to build the school next to the presbytery. The Franciscan cadastral survey shows neither the *tabor* walls nor the towers (see Fig. 2). Presentation of the *tabor* walls became possible after the local road to Dobrnič was rerouted and moved slightly

1 The presbytery is entered in the Register of Immovable Cultural Heritage as Mirna Peč – Old Presbytery (EŠD 26056).

2 The work was carried out by Tomaž Verbič of preliminary archaeological research specialists Arhej d.o.o. using MALÅ Geo-science equipment.

3 Following confirmation of the archaeological site, we issued an archaeological site decision pursuant to Article 27 ZVKD-1. This was followed by entry in the Register of Immovable Cultural Heritage under the name Mirna Peč – St Cantianus Archaeological Site (EŠD 30348).

to the north. This took place in 2014, when a new shopping centre was being built in Mirna Peč. While arranging the surrounding area, the builders came across a stone wall. The subsequent archaeological excavation confirmed that this was part of the foundations of a building from the early modern period known as the Osterc House. No older remains were discovered (Kovač, 2014: 2).

Presentation of the *tabor*

The development project was drawn up by Struktura d.o.o. of Mirna Peč. It is divided into three phases: renovation of the outside area around the church, renovation of the presbytery and arrangement of the outside area around the presbytery. The first phase, covering the arrangement of the outside area around the Church of St Cantianus and Companions, is presented below. The other phases have been postponed to a future date.

The project design took as a basis the ground plan drawn before and during construction of the church during the First World War (it is kept by the Dolenjska and Bela Krajina Unit of the Historical Archives of Ljubljana in Novo Mesto) (Figs 6a and 6b).

Below we shall look at the presentation of the *tabor* from the point of view of communication and the harmonisation of different views and wishes, since presentation means an arrangement of heritage that is realised with and for the public (Pirkovič, 2012: 14). In the case of the Mirna Peč *tabor*, the word *presentation* is used as a technical term that defines the arrangement of a monument and its parts in such a way as to make it accessible and comprehensible to a wide circle of people. All actions are subordinated to the aim of orienting the public and providing information (Pirkovič, 1993: 159–160). The method of presentation or promotion of public awareness is also supported by Article 9 of the European Convention on the Protection of Archaeological Heritage (the Valletta Convention),[4] while the public benefit of the protection of heritage and its social importance are covered by Articles 2 and 3 of Slovenia's Cultural Heritage Protection Act (ZVKD-1). For the presentation of the foundations of the Mirna Peč *tabor*, we chose reconstruction *in situ* in the pavement, despite the fact that international charters[5] do not generally favour presentations of this type. Article 15 of the Venice Charter rules out all reconstruction work on archaeological remains (Doktrina, 2014: 27), while Article 14 of the Burra Charter acknowledges or permits reconstruction as one of the forms of heritage conservation but requires (Article 15.2) that all changes to a monument are reversible. Article 7 of the Lausanne Charter accepts that experimental research and interpretation are important functions of reconstructions of archaeological heritage, but at the same time emphasises that reconstructions must always be recognisable as such (Doktrina, 2003: 49). We opted for partial reconstruction *in situ* because of the spatial limitations and the authenticity of the *tabor* ground plan. The area is delimited on the south side by a retaining wall that raises the flat area on which the church stands above the flood plain of the Temenica. To the east is the old presbytery or parish priest's house, below which the foundations of the *tabor* continue. The greater dimensions of the ground plan of church and presbytery have nullified any sense of its original size. We ensured reversibility by covering the documented and cleaned foundations of the *tabor* wall and tower with PVC film, over which a 10 cm thick reinforced concrete slab was laid as a separating layer. The foundations were reconstructed on the reinforced concrete slab. During construction, we attempted to imitate the appearance and construction method of the original foundations as authentically as possible. Grey cement was used for the pointing. Larger stones were used for the outside of the foundations, with smaller stones or rubble in the interior. The stone used for construction was supplied by the nearest quarry – Sv. Ana nad Vrhpečjo (Udovč, 2018: 177–159). In this we can make a claim for authenticity, since local stone was used to build tabors (Fister, 1975: 37). The planning documents envisaged a drainage channel along the inside of the wall, in the implementation of which the original wall was conserved, just as it was along the outside line. The inner side was sealed to prevent water penetration, while the outer side was protected and plugged. In places where no wall was present, a reinforced concrete foundation was built to a depth of 1 m, following the line of the foundations. Attention had to be paid to the incline in order to ensure water drainage (Struktura, 2016: 10), since if water were allowed to stand or freeze, it could damage the pavement. We could have opted for presentation in concrete, which would have been easier and quicker to implement, and also cheaper, but we wished to show the method of construction of the original *tabor*, since all that survived of it were there foundations. In the presentation, as in the original, the SW corner is constructed from large dressed stones. Such stones were only used to build the corners. Elsewhere, undressed stone was used (Fister, 1975: 37). The original idea for the presentation had to be supplemented by drawing in the newly discovered tower (see Figs 3 and 8). The tower and the junction of the tower with the foundations of the *tabor* had been damaged by modern infrastructure cable conduits. Presentation of the tower was made possible by moving the cable conduits behind the tower, since this will prevent further damage to the tower in the event of faults needing repair in the future. The perimeter of the tower was marked out by metal bands, with stones set in place between the bands (Fig. 7). In front of the church entrance, on the north side, the line of the foundations was interrupted in places (see Fig. 3). In this section, the foundations are covered by white concrete that runs to the tower, following the line and breadth of the wall. Despite our original desire to show an uninterrupted line, we accepted the idea of a broad band of white concrete in front of the church entrance (Fig. 8). At the time the walls were built around it, the church offered physical sanctuary as well as spiritual comfort.

Foundations belonging to an older (probably Gothic) phase of the church's construction are presented on the SW side, in front of the entrance to the present-day side chapel. The structure above the foundations is shown in the Franciscan cadastral survey for Carniola from 1825 (see Fig. 2) and is visible in a photograph taken a year before the demolition of the church (Pust, 1987: 40). Vančas interpreted it as a side chapel or confessional (plan in the Historical Archives of Ljubljana). The structure was demolished during the enlargement of the church in the modern era. We have cited the most recent interpretation, since more precise analysis of the historical development of the church has yet to be carried out. No finds that would enable more accurate dating were unearthed among the foundations. We proposed illustrating the foundations by means of wide mortar joints in the final pavement. Among the local community, the opinion was widespread that the foundations were those of a Romanesque church.[6] In accordance with the wishes of the local community, the foundations are presented under glass, despite the ZVKDS's serious concerns about the technical aspects of ensuring adequate ventilation. The foundations are in a walled, thermally insulated and waterproofed space covered by a glass pavement and fitted with a ventilation system and lighting (Fig. 9). Thermal insulation and a ventilation system do not prevent the growth of algae and other plants or the formation of condensation on the glass. The glazed area is outdoors,[7] and therefore more subject to temperature fluctuations than such arrangements inside buildings, for example the church on Bled Island (Petru, 1974: 82), Rajhenburg Castle, the Church of the Holy Spirit and the Pastoral Centre in Črnomelj, and so on. In the last of these examples, remains from late antiquity and a section of fifteenth-century town wall are presented behind a protective barrier made of heated glass, designed by M. Kovač[8] (Mason, 1999: 40–41).[9] The problem of ventilation and the formation of condensation on the glazed service has also been reported on from Belgrade, where the partial reconstruction of a road from ancient *Singidunum*, the predecessor of modern Belgrade, is presented beneath glass pavement panels outside the entrance to a shopping centre on Ulica Rajićeva (Plemić, 2018: 10).

The renovation of the church's surroundings has led to the creation of a small square in front of the church. This is conceived as a small semi-public space to be used for religious functions (Fig. 10). It is paved with concrete slabs measuring 1.5 x 2.4 m (Struktura 2016: 14). It lies right next to the road, opposite the shop. The parking area in front of the shop is also used by churchgoers. Visitor safety is ensured by massive bollards, which to some extent divert attention from the presentation, but at the same time visually separate the sacred space from the profane. The proposed solution of railings, which would have been less visually intrusive but still acceptable from the point of view of safety, and also cheaper, was not accepted. The planner's idea was that the bollards could be used as seats. The bollards did not meet the approval of the entire local community either. The siting of the fountain and infrastructure cables was conditioned by the existing location and existing cable conduits. A solution suitable for both sides was achieved in the case of the eastern line of the wall, which continues below the presbytery and on land that is outside the present construction development. The renovation of the presbytery and arrangement of the area around it are planned for the next phase of the project. In order to round off the appearance of the *tabor*, we have created a temporary visual indication of the foundations by means of a line of stones laid in a bed of sand. The presentation is located in an environment that has changed very little since the period in which the *tabor* was built. We assume that at that time, too, the *tabor* stood at the edge of

4 A convention is a treaty between two or more states and is internationally legally binding upon the signatories (Petrič, 2000: 5).

5 International charters and recommendations formulated on the basis of the best available expert positions and opinions at the time they are adopted (Fister, 2003: 11) and represent a kind of soft law (Petrič, 2000: 21).

6 They are also interpreted as Romanesque by the architect and planner J. Slak of Struktura (https://www.odprtehiseslovenije.org/objekt/zunanja-ureditev-okoli-cerkve-v-mirni-peci).

7 Some mosaics dating from the sixth century AD are presented under glass in the town of Novalja on the Croatian island of Pag, but even there algae and other plants are growing below the glass surface, despite the different, drier climate.

8 The "Eureka-Eurocare E! 1586 Arch in Situ" system uses special glass which allows visitors to walk safely over underground archaeological structures and view them just as they were found, while at the same time the structures are protected against decay. The system was developed by the architect Milan Kovač. Protected archaeological structures need similar climatic conditions to those in which they have survived over the course of thousands of years. The first such use of glass in Slovenia was at St George's Church near Slovenj Gradec in 1994. It has since also been used at the Pastoral Centre in Črnomelj (https://www.delo.si/novice/slovenija/inovativni-varuh-arheoloske-dediscine-pogumni-podpornik-beguncev/, 26 February 2019).

9 It would be worth examining and analysing different solutions for the protection of structures that are presented *in situ*, but this would exceed the scope of this article. In the case of Mirna Peč, a protective canopy would spoil the view and the appearance of the church, while also reducing the functionality of the space around it. Part of the purpose of the renovation was, in fact, to obtain a larger space.

a small settlement in the valley, surrounded by farmland. The Turks had unimpeded access to the *tabor* from the east along Mirna Peč Valley. South of the *tabor* and the church, the terrain rises gradually towards Golobinjek. To the north-west it rises towards Sveta Ana, while to the north it rises towards the hills dividing Mirna Peč Valley and Šentjurij Valley.
With this presentation, we kept in mind the fact that interpretation and presentation are part of the overall process of cultural heritage conservation and management and followed the principles proposed by the ICOMOS Charter for the Interpretation and Presentation of Cultural Heritage Sites (Doktrina, 2014: 48–53).

1. Access and Understanding

The presentation offers an insight into history. *Tabor*-type fortifications built as a defence against the Ottoman Turks are a part of rural architecture that has been unfairly neglected. Within the area covered by the Novo Mesto Unit of the ZVKDS, *tabors* are presented in Mirna Peč and Semič, while remains have also been discovered in Trebnje and Dolenjske Toplice.

2. Information Sources

The line of the *tabor* and tower were excavated and documented according to the principles of the archaeological profession. We took these results into account when preparing the plan of the presentation and in the execution of the presentation.

3. Attention to Setting and Context

The newly discovered remains represent additional content for the new arrangement of the area around the church. They confirm an oral tradition that is strongly present in the local community. They are simultaneously a memory and a reminder. The discovery of a Slavonic burial ground dating from the tenth to the eleventh century at least partly explains why one of the oldest parishes in Dolenjska was founded in Mirna Peč.

4. Preservation of Authenticity

The foundations are well preserved, although in places they have been destroyed by modern building work. The line of the *tabor*, as confirmed by archaeological research, is shown. The foundations of an older phase of construction, which Vančas described as a side chapel next to the Gothic sanctuary at the time of the construction of the new church, are presented under a glass pavement.

5. Planning for Sustainability

The presentation and knowledge about the site will be incorporated into the local community. The site is close to the busiest points in Mirna Peč: next to the church and opposite the shop. The area is flat and the presentation is also designed without any differences in level, meaning that it is also accessible to persons with reduced mobility and the disabled. It could be included as supplementary content in the programme of the local museum dedicated to musician Lojze Slak and poet Tone Pavček. Infrastructure cables have been moved and laid in such a way that the site and presentation will not be damaged by any future repairs that may be necessary. In order to avoid additional interventions in the ground in the area of the burial site, we affixed an information panel to a streetlight, which simultaneously serves to illuminate it.

6. Concern for Inclusiveness

The presentation is the result of cooperation involving the Novo Mesto regional unit of the Institute for the Protection of Cultural Heritage of Slovenia, planning company Struktura d.o.o., building contractor Gradbeništvo in prevozi A. Kregl s.p. and the parish priest Fr J. Rihtaršič. Despite differences of opinion, for the most part consensus was achieved following constructive discussions. The ZVKDS argued in favour of documented facts, while the planner and architect were for illustrative freedom.

7. Research, Training and Evaluation

Throughout the archaeological investigations, and also while preparing the presentation, we worked with the local community by providing information in the local media. An information panel containing basic information has been installed at the site. Information on the site will be supplemented by the research carried out in the next two planned phases of the project.

A major problem of archaeological monuments presented *in situ* is maintenance. Maintenance in this context means cleaning, maintenance and repairs to deteriorating elements within respective spheres of competence. It is influenced by the awareness of the local community, in other words by whether the latter has successfully identified with the monument, and by distance from urban centres (Sagadin 2014; Bratina 2014). This particular presentation is situated in the centre of Mirna Peč next to the church, so its maintenance will be looked after by the local parish. The local community is also in favour of it.

Popularisation

We published the results of the archaeological investigations in the municipal newspaper. A news item also appeared in the online and print editions of the regional newspaper *Dolenjski list*. The archaeological investigations took place in the summer of 2016 in what was a "slow news period", with the result that an article was published on the RTV Slovenia website (16 August 2016, https://www.rtvslo.si/kultura/drugo/arheoloski-najdbi-v-mirni-peci-protiturska-utrdba-in-slovansko-grobisce) and the story also featured on the main television news (19 August 2016). After completing our investigations, at the invitation of the parish priest we presented the cultural heritage of the municipality of Mirna Peč, the history and development of *tabors* and the results of the archaeological investigations.10 The presentation was followed by a guided tour of the site. Both the presentation and the tour were well attended. In June 2017, on the completion of works and coinciding with the anniversary of the consecration of the church, the Parish of Mirna Peč issued a publication entitled "Centenary of the Consecration of the Parish Church in Mirna Peč". An information panel has been installed at the site, although unfortunately the information is only in Slovene for the time being. The enthusiastic archaeologists from Magelan Skupina d.o.o. have also proposed creating a QR code as a way of bringing the site closer to technologically minded visitors. This would also enable the provision of more detailed information, along with graphical and photographic material. The archival documentation of the archaeological site also includes 3D images, orthophotos and drone footage of the excavation.

Outdoor presentations in Slovenia

By 2012 a total of 44 archaeological sites from different periods, of different sizes and with different development potential had been presented *in situ* in outdoor locations in Slovenia. These have been evaluated in detail by Andreja Breznik (2012: 174–183; 309–349). Among the better preserved and now restored *tabors* built as a defence against the Ottomans is the *tabor* around the church in Cerovo near Grosuplje (Fister 2006: 70–71). Below we will present the most recent presentations from the Middle Ages in the area covered by the Novo Mesto unit of the ZVKDS. Part of the *tabor* in Semič was presented in 2014, while another part is still preserved within the complex of church buildings. The double line of the walls is preserved. Two round towers and the connecting lines of the wall are presented in the pavement at two different levels in front of the church entrance. Granite, which stands out from its surroundings, was used to present the towers and walls. The same method could be used to at least indicate the connection of the tower with the rest of the walls. The original wall of the SW tower is still preserved and visible below the granite covering (Fig. 11). The crumbling town walls known as Šance (from the German *Schanze*, a type of fortification or fieldwork) on *Kapiteljski hrib* (Chapter Hill) in Novo Mesto were restored the same year. Medieval walls with defence towers, in other words a *tabor* complex, are presented as part of the renovated Vinica Castle (Omahen and Britovšek 2018: 278). The south wall (complete with loopholes) and SW tower of a *tabor* are presented in Dolenjske Toplice as part of a complex of church buildings (Peskar, 2015: 174). During repairs to the foundations in the north corner of the presbytery, archaeologists documented and excavated the oval tower of a *tabor*, which was then refilled when the work was complete (Peterle Udovič, 2014: 50–51). At Otok near Dobrava, in the area of the medieval market town of *Gutenwerd*, also *Gutenwerth* (a possession of the bishopric of Freising), the remains of a church dedicated to St Michael are presented beneath a thatched roof. *Gutenwerd* was destroyed by the Turks in 1473. One of the more recent open-air presentations is located in Novo Mesto, where a medieval road and part of the lower town gate are presented in the pavement (Fig. 12).

Conclusion

The recording of a Slavonic burial ground dating from the tenth to the eleventh century by the Church of St Cantianus and Companions in Mirna Peč is complemented by the context of ancient parish centres and the settlement picture, and at the same time at least partially explains why an ancient parish was established here. More answers will be obtained once archaeological excavation of the burial ground has been completed. For now, the burial ground is the only known archaeological site in Mirna Peč Valley.
By the end of the fifteenth century, a systematically distributed network of between 350 and 400 *tabors* of all shapes and sizes had grown up across Slovenia to serve as refuges during Turkish raids. Only a few have survived intact to the present day, most of them in the northern Koroška region. The majority of *tabors* only disappeared in the eighteenth and nineteenth centuries after long years of decay (Fister, 2006: 34). Some better preserved *tabors* have been restored, for example Cerovo above Grosuplje or Šmarna Gora, while in places parts of *tabor* walls survive in complexes of church buildings, such as in Semič, Dolenjske Toplice and Cerknica. In the case of the Mirna Peč *tabor*,

10 The presentation was given by the conservator Katarina Udovč of the ZVKDS and the archaeologist Rok Bremec of Magelan Skupina.

only the foundations have survived. These were excavated and documented during archaeological investigations. Although no traces were visible on the surface, a memory of the *tabor* was conserved in oral tradition. The foundations of the early-sixteenth-century, medium-sized *tabor* in Mirna Peč are presented in the pavement *in situ*. We ended the reconstruction and presentation of the *tabor* at the point where imagination would have taken over, given the poor state of conservation. An added value of today's presentation is a setting that has changed very little since the *tabor* was originally built. The *tabor* lies on the edge of the settlement and, just as when it was built, is surrounded on three sides by fields and the river Temenica. One of many at the time of its construction, today it is one of just a few *tabors* of which at least the foundations survive and are presented in the pavement, and as such helps us create and understand an image of the landscape in the difficult times of the fifteenth and sixteenth centuries.

References

BRATINA, P. (2014): Kako upravljamo z arheološkimi spomeniki v zahodni Sloveniji. – *ARHEO* 31, 185–193.

BREZNIK, A. (2012): *Upravljanje arheološkega parka RS*. – Doctoral thesis. Accessible at: http://dk.fdv.uni-lj.si/doktorska_dela/pdfs/dr_breznik-andreja.PD.

BRITOVŠEK, T., and KOVAČ, O. (2017): Semič – območje tabora, Semič – cerkev sv. Štefana, Semič – trško jedro. – *Varstvo spomenikov, poročila* 52, 205–207.

DAMJANOVIĆ, D. (2014): Neogotička arhitektura u opusu Josipa Vancaša. Radovi u Italiji, Hrvatskoj in Sloveniji. Neo-Gothic Architecture in Josip Vancaš's Works in Italy, Croatia and Slovenia. – *Prostor 22, Znanstveni časopis za arhitekturo in urbanizem. A scholarly journal of architecture and urban planning*, Zagreb.

Djokić, S., and Rozman, L. (2016): *Končno strokovno poročilo o arheoloških raziskavah v sklopu zunanje ureditve okolice sv. Kancijana v Mirni Peči*. Kranj, unpublished report.

DOLINAR, F. M. (1993): *Prošti novomeškega kapitlja: 1493–1993*. Novo Mesto: Dolenjska založba.

DRAŽUMERIČ, M., and BRITOVŠEK T. (2014): *Semič proti-turški tabor*. – ZVKDS leaflet.

FISTER, P. (1975): *Arhitektura slovenskih protiturških taborov*. Ljubljana: Slovenska matica.

FISTER, P. (2003): Varovanje kulturne dediščine kot nova vrednota. – In: *Doktrina* 1 (ed. Grobovšek, J.), 11–14. Ljubljana: ICOMOS Slovenia.

FISTER, P. (2006): Tabor nad Cerovim pri Grosuplju. In: *Gradovi, utrdbe in mestna obzidja: vodnik po spomenikih*. Dnevi evropske kulturne dediščine (ed. Gorenc, N.), 70–71.

FISTER, P. (2006): Protiturški tabori na Slovenskem. In: *Gradovi, utrdbe in mestna obzidja: vodnik po spomenikih*. Dnevi evropske kulturne dediščine (ed. Gorenc, N.), 33–40.

HÖFLER, J. (2016): *O prvih cerkvah in župnijah na Slovenskem*. Ljubljana: Viharnik.

JUG, S. (1943): Turški vpadi na Kranjsko in Primorsko do prve tretjine 16. stoletja.

Kronologija, obseg in vpadna pota. In: *Glasnik Muzejskega društva za Slovenijo*, XXXIV, 1–4, Ljubljana, 1–61.

Kovač, O. (2014): *Strokovno poročilo o predhodni arheološki raziskavi – arheološka raziskava ob gradnji na delu parcel št. 615/8 in 615/7, k. o. Mirna Peč, občina Mirna Peč*. – Neobjavljeno poročilo.
MASON, P. (1999): Arheološko najdišče Črnomelj. In: *Kulturne poti: vodnik po spomenikih*. Dnevi evropske kulturne dediščine (ed. Batič, J.), 33–41.

Mason, P. (2018): The Empty Quarter: the Early Medieval period in South-Eastern Slovenia in the Light of Recent Research. In: *Vestnik XXVII, Slovani, naša dediščina / Our Heritage: The Slavs* (eds Lux, J., Štular, B. and Zanier, K.), 91–102.

PIRKOVIČ, J. (1993): *Osnovni pojmi in zasnova spomeniškega varstva v Sloveniji*. – Vestnik 11.

OMAHEN, M. and BRITOVŠEK, T. (2018): Vinica – arheološko najdišče ob gradu, Vinica – grad. – *Varstvo spomenikov, poročila 53*, 275–278.

PIRKOVIČ, J. (2012): *Arheološko konservatorstvo in varstvo nepremične kulturne dediščine: učbenik za predmet Arheologija za javnost*. Ljubljana: Znanstvena založba Filozofske fakultete Univerze v Ljubljani. Accessible at: https://e-knjige.ff.uni-lj.si/znanstvena-zalozba/catalog/download/101/193/2562-1?inline=1.

PESKAR, R. (2015): Župnijska cerkev sv. Ane in nekdanji tabor. – *Dolenjske Toplice v odsevu časa* (ed. Peskar, R.), 153–179.

PETERLE UDOVIČ, P. (2014): Dolenjske Toplice – župnišče in Dolenjske Toplice – vaško jedro. – *Varstvo spomenikov, poročila* 49, 50–51.

PETRIČ, M. (2000): *Mednarodno pravno varstvo kulturne dediščine*. Ljubljana: Ministrstvo za kulturo, Uprava RS za kulturno dediščino.

PETRU, P. (1974): Blejski otok urejen. – *Varstvo spomenikov* XVII–XIX/1, 79–84.

PUST, A. (ed.) (1987): *Mirna Peč z okolico nekoč in danes*. – Župnijski urad v Mirni Peči.

SAGADIN, M. (2014): (Ne)upravljanje arheoloških spomenikov na Gorenjskem. – *ARHEO* 31, 177–185.

PLEMIĆ, B. 2018: Rimski ostaci u tržnom centru „Rajičeva': Nova turistička atrakcija Beograda ili primer devastacije arheološkog nasleđa? Roman Remains in Rajićeva shopping centre: A new tourist attraction in Belgrade or a case study in the devastation of cultural heritage? – *Turisticko Poslovanje* 21, 5–12 (doi:10.5937/TurPos1821005P).

Struktura (Slak, J.) (2016): *PGD, A-1520*. Novo Mesto.

Udovč, K. and Rozman, L. (2017): Mirna Peč – Arheološko najdišče sv. Kancijan in Mirna Peč – Cerkev sv. Kancijana. – *Varstvo spomenikov, poročila* 52, 147–148.

Udovč, K. (2018): Mirna Peč – Arheološko najdišče sv. Kancijan in Mirna Peč – Cerkev sv. Kancijana. – *Varstvo spomenikov, poročila* 53, 156–159.

Verbič, T. (2016): *Poročilo o georadarski raziskavi ob cerkvi sv. Kancijana v Mirni Peči*. –Neobjavljeno poročilo.

VOJE, I. (1996): *Slovenci pod pritiskom turškega nasilja*. – Znanstveni inštitut Filozofske fakultete, Ljubljana.

Franciscan cadastral survey for Carniola, Archives of the Republic of Slovenia. http://www.arhiv.gov.si

Charters and Laws

Burra Charter. The Australia ICOMOS charter for places of cultural significance. Burra, 1999, Australia ICOMOS, http://australia.icomos.org/burra.html.

ICOMOS. 1964. International Charter for the Conservation and Restoration of Monuments and Sites (Venice Charter). In: *Doktrina 1. Mednarodne listine ICOMOS*, ed. Jovo Grobovšek, 2003, 25–8. Ljubljana: ICOMOS Slovenia.

ICOMOS. 1990. Charter for the Protection and Management of the Archaeological Heritage (Lausanne Charter). 2003. In: *Doktrina 1. Mednarodne listine ICOMOS*, ed. Jovo Grobovšek, 2003, 45–50. Ljubljana: ICOMOS Slovenia.

ICOMOS. 2008. Charter for the Interpretation and Presentation of Cultural Heritage Sites (Quebec Charter). In: *Doktrina 2/Mednarodne listine in dokumenti. Doctrine 2/ICOMOS International Charters and Documents*, eds Jovo Grobovšek, Maja Oven and Blaž Šeme, 2014, 48–53.

Valletta Convention – Act ratifying the European Convention on the Protection of the Archaeological Heritage (revised) (MEKVAD). UL RS MP 7/99. La Valletta, 1992, Council of Europe.

Ordinance on the proclamation of landmarks and immovable cultural and historical monuments in the municipality of Novo Mesto. UL RS 38/92–1927.

Cultural Heritage Protection Act (ZVKD-1). UL RS 16/08. Ljubljana.

Lucija Stepančič

Intervju s prof. Francem Kokaljem

»Vso Slovenijo sem večkrat prepotoval in raziskal, pa še dosti sveta. Kaj bi si lahko želel boljšega?«

Franca Kokalja seveda vsi poznamo kot dolgoletnega dekana Akademije za likovno umetnost in oblikovanje, kot profesorja in mentorja, predvsem pa kot ustanovitelja Oddelka za restavratorstvo na takratni Akademiji za likovno umetnost. Njegovo pedagoško delo pa se ni omejevalo le na ljubljansko akademijo in na terenske posege po vsej Sloveniji, ampak je sodeloval tudi pri ustanavljanju restavratorskih oddelkov na likovnih akademijah v Sarajevu in Zagrebu, kot soustanovitelj Kulturološke fakultete v Cetinju je predaval tudi v Črni gori in kot Unescov ekspert za restavriranje kamna celo v Ciudadu de México. Nagrado Mirka Šubica za življenjsko delo je prejel leta 2010.

Prav tako kot po dosežkih pa slovi po neverjetni podjetnosti, energiji, pa tudi živahnem in komunikativnem značaju. Med študenti in kolegi je vedno poznal vse in vsakogar in je še danes prava zakladnica spominov in anekdot. Ob devetdesetletnici smo ga povabili, naj jih nekaj podeli z nami. Vabilu se je z veseljem odzval.

Franc Kokalj (foto: Tihomir Pintar)

Začneva na začetku? Z vašo fascinacijo nad umetnostjo? Kaj vas je v času šolanja navedlo, da ste se odločili za študij kiparstva in kasneje za restavratorstvo?
Kar poglej si tole fotografijo. Tukaj sem star 15 let. Kmalu po vojni je bilo.

Pred štafelajem z dokončano sliko, kot pravi slikar.
Material se ni dobil, ampak Sternen mi je dal svoje zaloge, ko je sam nehal slikati, tako da sem bil bogato založen s platni, barvami in čopiči. Še zdaj jih imam.
Čisto na začetku sem mislil, da bom šel študirat slikarstvo. Profesor Kolenc pa me je na gimnaziji prepričal, da bi bil boljši kipar. Tako sem odšel na pripravljalko, ki je obstajala v tistih časih, oziroma v zbirni letnik.

Kakšne možnosti pa je imel v tistih časih otrok, ki je rad risal, kakšne možnosti je imel študent? Danes je vse dosegljivo, a tako kaotično, da mlade kar odvrača od ustvarjanja.
Slikal sem portrete in krajine, na bežigrajski gimnaziji smo imeli likovni krožek in veliko se je delalo, smo bili kar ambiciozni. Nazadnje pa sem šel na akademijo samo jaz, saj je matura vse ostale preveč zamorila. V študentskih letih mi je pomagal tudi Veno Pilon; kadar sem šel v Pariz, sem se vedno oglasil pri njem, kot nekakšen ambasador je bil. Bil je zelo velikodušen, zavzel se je za vsakega Slovenca, ki je prišel tja, ogromno je pomenilo že to, da je vedel, kje se da najceneje prenočevati, njegov umetniški vpliv pa je seveda še veliko več vreden. Lahko rečem, da sem imel srečo, da sem bil obdan z velikimi ljudmi, ki so mi bili naklonjeni.

Ste svoje delo restavratorja videli povezano s svojimi ustvarjalnimi interesi? Se je oboje dopolnjevalo, ali pa si je nasprotovalo?
Tudi potem, ko sem bil že zaposlen kot restavrator, nisem nehal slikati. Najlepše se je delalo na terenu. Popoldne, po končanem delu po cerkvah, smo mnogi pograbili slikarski material in šli slikat ven; če je bilo treba, smo se odpeljali tudi kam dlje. Največ sem slikal s Francem Novincem, ki je kasneje postal profesor risanja na akademiji, in z Miho Pirnatom. Tako se mi je nabralo kar nekaj slik in imel sem dovolj še za razstave.

Tudi Miha mi je pravil o tem, to je bil pravi ex tempore. In tukaj imam podatke o vaših razstavah: po vsej Sloveniji in še v Črni gori. Ampak mislim, da ste v restavratorstvu prav tako uživali.
Na akademiji je profesor Šubic vplival na mnoge, da smo se začeli zanimati za restavratorstvo. Odločil sem se za podiplomski študij pri njem. Kasneje sem dobil Prešernovo štipendijo za študij v Münchnu na Doernerjevem inštitutu. Od tam sem odšel v London, v Narodno galerijo in v Viktorijin in Albertov muzej, na Osrednjem inštitutu v Rimu pa sem bil pol leta. Obstajale so štipendije, na primer Moše Pijada, dobil sem jo za kongres na Portugalskem. Ker Jugoslavija še ni imela diplomatskih stikov s Portugalsko, mi je prijatelj Geoffrey Hitchcock pripravil vstopno vizo. Tam smo bili Franc Novinc, Ivan Bogovčič in jaz, povabljeni smo bili na Ministrstvo za kulturo, ker smo bili edini iz vzhodnega bloka. Še danes bi šel ven študirat.

»V pripravljalki smo portretirali drug drugega. Takole me je narisal Andrej Jemec« (foto: Miha Benedičič)


Avtoportret iz leta 1960 (foto: Miha Benedičič)


Franc Kokalj, Breginj, olje na platnu, 1963 (foto: Miha Benedičič)

To se še v današnjih časih sliši sijajno. Namesto vsega tega imamo danes videokonference. In Hitchcock?
Sorodnik režiserja Hitchcocka, direktor Britanskega sveta pri nas. Doma je bil iz Tiptreeja, bil sem tam na obisku, poglej to hišo (ogledujeva si fotografijo). Angleži imajo najbolje ohranjeno krajinsko arhitekturo, pa tudi najboljšo spomeniško zakonodajo.

Vedno ste bili v središču dogajanja, poznali ste vse restavratorje in konservatorje. Kaj se je po vašem mnenju najbolj spremenilo v zadnjih 40 ali 50 letih?
Moja prva zaposlitev je bila na Republiškem zavodu za spomeniško varstvo, na Oddelku za restavratorstvo. Prvi v Jugoslaviji smo imeli restavratorski oddelek. Bil je zelo znan po vsej bivši skupni državi, vsi so prihajali k nam, ljubljanska akademija je tudi prva imela podiplomski študij restavriranja, zato je k nam prišlo tudi zelo veliko drugih

študentov.
Danes ima vsak zavod samostojni oddelek ali delavnico za restavriranje, zato je manj sodelovanja. Nismo pa imeli centralne komisije, kot jo je imela Avstro-Ogrska.

V tisti komisiji je bil še Stele.
Na Dunaju imajo še vsa njihova poročila, tudi o delih na Slovenskem. O vsem, kar se je delalo pred prvo svetovno vojno.

Sternenovi časi.
In še pred Sternenom. Pri Sternenu sem bil dvakrat, ampak takrat je bil že zelo star. Predstavila mi ga je mati Pia Garantini, ki se je pri njem učila restavriranja. Bila je prednica uršulink, ravnateljica uršulinske gimnazije, izjemna intelektualka, študirala je v Benetkah in Ljubljani. Moja prateta, sestra moje stare mame.

Na področju organiziranega varstva je vaša generacija orala ledino, in to ni majhna stvar. Stroka se je morala šele uveljaviti, tako v svojih standardih kot tudi v zavesti ljudi.
Delo na terenu je bilo zelo težavno. Nismo imeli kje stanovati, hrane ni bilo, spali smo na podstrešjih, v Zanigradu sva z Novincem prenočevala na zapuščenem skednju, zjutraj sva ugotovila, da je takoj zraven naju velika luknja, lahko bi padla skoznjo. Posebno nevarni so bili tudi odri, saj so jih postavljali domačini kar sami, tako kot so jih pač postavljali, po navadi slabo. Niso bili niti varni niti funkcionalni. V Svetini sem moral čopič privezati na palico, da sem dosegel ornamente, ki sem jih retuširal in rekonstruiral.
Prav pustolovsko je bilo, nikoli nismo vedeli, kaj nas čaka. Ponekod pa so nam celo pripravili prenočišče v župnišču, in v Vremskem Britofu smo vse večere kvartali z župnikom in kuharico, bila je sestra kiparja Goršeta.
Sicer pa sem imel najraje raziskovalne naloge na terenu. Pripravil sem dve: Srednjeveške freske na zunanjščinah in kasneje Likovni dekor na fasadah na potresnem področju.

V današnjih časih bi vam inšpekcija prepovedala delo, če odri ne bi bili postavljeni popolnoma po predpisih, restavratorji pa ne bi delali, če ne bi bilo dnevnic, prevozov in prenočišč. Ogromno zanesenjaštva je moralo biti, da se je sploh kaj naredilo.
Veliko sem delal na terenu, še zdaj delam. Zdaj moram v Rogaški Slatini sondirati dve cerkvi, da ju lahko začnejo obnavljati. Doma pa čistim tole sliko, poglej. Naslednji teden jo prinesem k vam v Restavratorski center na rentgen, se mi zdi, da je precej preslikana.

Še vedno delate?
Rad sondiram omete, dvakrat sem pri tem takoj naletel na portret, v Breginju se je pod ometom pokazal hudič, na Dolenjskem pa se mi je pokazal angel.

No, enkrat angel, enkrat hudič.
Prav res (smeh). Ampak tega še zdaj niso začeli odkrivati.

Se ne mudi.
Freske so pod ometi in beležem še najbolj na varnem. Potem ko so enkrat odkrite, jih začnejo ogrožati okoljski dejavniki. Pomembno pa je, da vemo, kje vse jih imamo, da jih dokumentiramo in pregledamo ter razporedimo delo.

Kateri pa je vaš najljubši projekt? Oziroma najlepši? Najuspešnejši? Česa se najraje spominjate?
Vse sem rad delal, vse me je veselilo. Zelo zanimivo je bilo v Kostanju, v podružnični cerkvi sv. Marjete v Tuhinjski dolini, kjer najdemo vsa obdobja, od romanske osnove do gotske prezidave in baročnega oltarja. Po Steletovih fotografijah sem rekonstruiral leseni strop, obnovil gotske freske v prezbiteriju, križev pot, dva baročna kipa in oltar, na koncu pa naredil še avtorske vitraže. Vnaprej so mi določili le to, da morajo prikazovati sv. Elizabeto, sv. Miklavža, sv. Martina in sv. Dorotejo, ker so njihovi zavetniki, v likovnem smislu pa so mi dali proste roke. Zelo lepo je delati nekaj tako celovitega in proučiti zares vse faze od začetka do konca, za povrh pa ustvariti še nekaj svojega.

Drugi se raje hvalijo s kakšnimi zvenečimi imeni. Vi bi lahko navedli restavriranje eksponatov za jugoslovansko razstavo v Parizu, dvorec Zemono, Pretorsko palačo v Kopru, še celo hotel Palace v Portorožu. Je pa po drugi strani še lepše, da ste našli kvaliteto izven tega, kar je umetnostnozgodovinska stroka že dodobra raziskala. Obiskovalci muzejev in ljubitelji umetnosti grejo po uhojenih poteh, restavrator pa po divjini. V tem je seveda mogoče videti tudi prednost, in vi jo vidite.
Kranjski zavod bi se lahko bolj zavzel za to podružnico, ampak tako je na zavodih, sto stvari morajo delati. V Kostanju so se omejili na odpravo škode, ki jo je povzročil požar. Obstajali so sicer tudi Plečnikovi načrti za preoblikovanje, ampak se niso uresničili.

Vse, kar je danes mogoče izvedeti o Steletu, je sicer že iz druge ali tretje roke. Vendar je še mogoče govoriti z ljudmi, ki ste ga svoj čas osebno poznali in z njim sodelovali. Kako se vi spominjate sodelovanja z njim?
Nisem sicer delal neposredno pod Steletovim vodstvom, sem ga pa vedno povabil na komisijski ogled in je zelo rad prišel, še posebej v Sevnico, v Lutrovo klet. Vzdušje je bilo prijateljsko. Dosti je bilo prijateljskega druženja, skupaj smo šli na kosilo in tam razpravljali. Tudi rivalstva so obstajala, predvsem glede vprašanja, kdo naj bi bil prvi konservator, v glavnem smo se pa dobro razumeli. Včasih nas je tudi kakšen župan lepo pogostil. Stele je imel rad rdeče vino, vendar si ga je vsakokrat privoščil le po en kozarec.
Kasneje, ko sem si kupil svoj avto, so se vsi hoteli voziti z mano, saj sem imel borgwarda arabello. Vozil sem Steleta in Dobido, direktorja Narodne galerije, pa tudi Turnherja, direktorja republiškega zavoda. Šubica pa sem peljal z motorjem. Še zdaj sem vesel, da smo toliko hodili okrog.

Ves čas ste sodelovali s kolegi iz bivše skupne države. Verjetno so vas povabili tudi h kakšnemu projektu povojne obnove na Hrvaškem in v Bosni.
V Cetinju sem skupaj z Momom Vukovičem in Ivanom Bogovčičem poučeval tudi študente iz Dubrovnika in potem smo po vojni skupaj obnavljali mestno hišo in oltar iz leta 1552. Še zdaj imam stike s temi ljudmi.

Na podiplomskem študiju restavratorstva ste nam študentom govorili: »Lepo je biti restavrator, ker imaš vedno polno umetnosti okrog sebe.« Vidite, da tega do danes nisem pozabila. Upam, da se spomnijo tudi drugi, kadar je najtežje.
Na podiplomski študij pridejo ljudje že formirani, vejo, kaj hočejo.

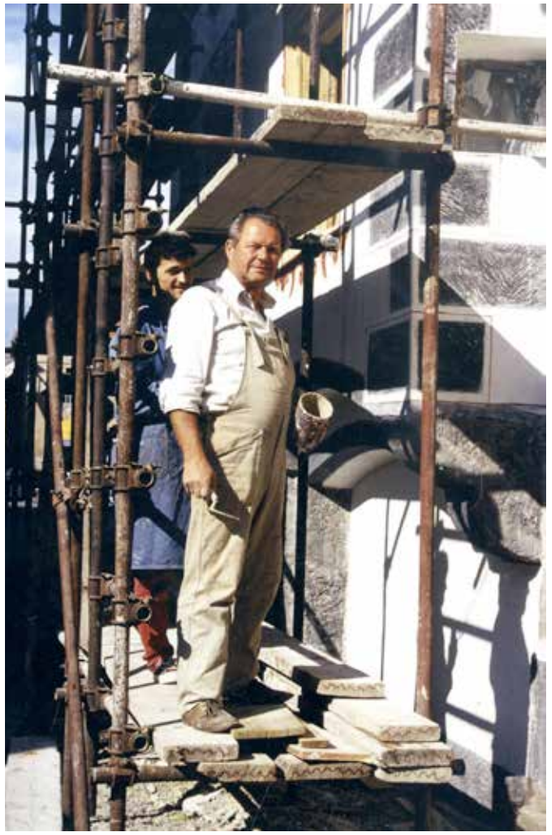
O vsaki umetnini, ki ste jo imeli kdaj pred sabo, ste govorili s takim navdušenjem, da nisem nikoli mogla uganiti vašega osebnega okusa. Ga lahko izdate zdaj? Kaj iz naše dediščine vas najbolj navdušuje? Katero obdobje ali avtor? Lahko pa mirne duše tudi poveste, če česa ne marate. To bo mogoče še bolj zanimivo.
Restavrator nima pravice razsojati o umetniški vrednosti, čeprav so nekateri to seveda vedno počeli. Jaz pa sem bil vedno raje kot zdravnik, ki ne dela razlike med pacienti. Vsako sliko sem obravnaval, kot da ima pravico biti taka, kot je; to je vendar delo avtorja, ki je lahko zelo drugačen od mene, a ravno to je zanimivo, da smo si vsi tako različni.

O tem sva že govorila, o tej posebni demokratičnosti, ko umetnine ne gledaš s stališča, kako jo vrednoti umetnostna zgodovina, ampak razviješ samostojno presojo, ki pa ni vrednostna. Za večino ljudi je umetniška fascinacija stvar muzejev in galerij, za tisto, kar imajo pred nosom, pa se ne zmenijo. Restavratorski poklic je idealen za odkrivanje izven uveljavljenih okvirov.
V umetnosti imam rad raznovrstnost, vedno je nekaj novega in zato zanimivega.

Imate tudi zasluge za uvedbo dodiplomskega študija restavratorstva na ALUO. Kako je potekal ta preboj?
Restavratorstvo smo imeli kot izbirni predmet na dodiplomskem študiju slikarstva in kiparstva, pa tudi kot podiplomski študij. Ampak seveda kmalu ni več zadoščalo, da bi restavrirali samo umetniki, kadar jim zmanjka denarja, potreben je bil celovit pristop, predvsem pa študenti, ki bi bili restavratorji že od samega začetka. Za uvedbo restavratorskega oddelka sem se odločil v času, ko sem bil

Bogward arabella za terenske oglede v šestdesetih letih

Četena Ravan, restavriranje freske sv. Krištofa leta 1985



Kranj, restavriranje Mitnice leta 1990

še dekan na ALU, in tako smo ga dobili leta 1996. Najbolj sta me podpirala kolega Andrej Jemec in Herman Gvardjančič.
Moram povedati, da sem s svojim predlogom vsepovsod naletel na razumevanje, tako na svetu univerze kot na Ministrstvu za kulturo in celo na Ministrstvu za finance. Pa ni šlo samo za načelno razumevanje, ampak za uresničevanje predloga, čeprav ni bilo lahko zagotoviti vsega, kar je oddelek potreboval, od prostorov, pogojev, materiala, tehnologije, financiranja in pedagoškega kadra.
Občutek imam, da je danes vse težje, izginile so povezave med ljudmi, povezave med strokami; ideje, ki zahtevajo sodelovanje zelo različnih profilov, se težje izpeljejo.

Za celovito varstvo dediščine je izobraževanje restavratorjev slikarjev in kiparjev premalo. Morali bi obuditi tudi nekaj tradicionalnih obrti, ki izumirajo, in došolati vsaj nekaj obrtniških vajencev s posluhom. Lahko pomagate s kakšnim nasvetom?
Zelo veliko je dobrih slikarjev, ki pa nimajo prav nobenega smisla za tehnična opravila. Kiparji smo glede tega na boljšem, smo veliko bolj ročni, a vseeno je za obrtniška dela bolje, da se jih lotevajo obrtniki. Različne naloge bi morali opravljati različni ljudje. Je pa res, da tradicionalne obrtnike vse težje dobiš, izumira nam ogromno znanja.

In danes, ko gledate nazaj? Bi se še enkrat odločili za ta poklic?
Ja! Vso Slovenijo sem prepotoval in raziskal, vsevprek, in to velikokrat, pa še lep del sveta. Kako bi si sploh lahko želel kaj boljšega?

V spomin / In memoriam

Dr. Marijan Slabe

(foto: Valentin Benedik)

Marijan Slabe (17. 3. 1932–23. 4. 2022) je bil žlahten nadaljevalec zgledov prvega slovenskega konservatorja Franceta Steleta. V veliki meri je duhovno ohranjanje dediščine razložil v drobni publikaciji z naslovom Etični kodeks Slovenskega konservatorskega društva. Za natis kodeksa se je kot konservator po duši zavzemal vrsto let. Zapis sestavlja 38 kratkih odstavkov, ključnih za delo vsakega varuha dediščine. Prvi se glasi: »Konservator je svobodna osebnost. Nanj ne sme vplivati nobena sila, ki bi ga kakorkoli ločevala od ustreznega strokovnega nivoja dela ali odločitev. Strokovno delo konservatorja mora biti neodvisno.«

Slabe je že v rani mladosti skupaj z družino spoznaval značaj slovenske krajine in ljudi. S starši se je selil iz Radovljice in Tržiča v Cerknico ter naprej. Na poteh se nikoli ni ustavil; večno radoveden je tudi kasneje hodil po domovini in sosednjih državah. Kljub mladosti je razumel ter globoko v svojo zavest vtisnil sence vojne in dogajanj po njej. Humanistično usmerjen se je odločil za študij arheologije na Filozofski fakulteti ljubljanske univerze. Diplomiral je leta 1959 s tematiko o neolitiku v Grčiji.

Njegovi službeni začetki so bili med pedagogi. Za vedno mu je ostala neka nevsiljiva učiteljska drža, da je mlajšim kolegom z veseljem pomagal z nasveti ter spremljal strokovni razvoj arheologov in konservatorjev ali poznavalsko razlagal zgodovinske teme v krogu prijateljev. Ob poučevanju se je takoj posvetil ohranjanju dediščine. Bil je med prvimi profesionalnimi zbiralci premične dediščine za muzeja v Kočevju in Ribnici, na območju, kjer je bilo po vojni malo ljudi in še manj ohranjene dediščine. Sam se je razvil še v bibliofila in kartofila. Poznal je skoraj vse slovenske knjige. Podobno kot Ivan (Drago) Komelj jih je zbiral v svoji bogati knjižnici, ki jo je kasneje zapustil kolegom konservatorjem in restavratorjem na Zavodu za varstvo kulturne dediščine.

Sredi šestdesetih let prejšnjega stoletja je dobil službo na Zavodu za ureditev stare Ljubljane, kasneje preimenovanem v Regionalni zavod za varovanje dediščine. Ljubljanski zavod je v šestdesetih in sedemdesetih letih skrbel za četrtino Slovenije in njeno prestolnico. Slabe je bil dolgo edini arheolog te institucije. Kot terenski konservator-arheolog in organizator je bil osrednja oseba pri izkopavanjih okoli ljubljanskega srednjeveškega Šempetra, pri grobišču iz obdobja preseljevanja ljudstev v Dravljah in pri številnih manjših, a kljub temu odmevnih raziskavah od Bele krajine, Škofje Loke do Polhograjskih dolomitov. Podobno pionirske so bile tedaj njegove manj uveljavljene arheološke raziskave posameznih grajskih razvalin, npr. ljubljanskega Gradu ali Kostela. Za svojo dolžnost je imel tudi redno objavljanje svojih izsledkov. Njegovi redki

nasledniki so podobno disciplinirano objavljali v strokovni reviji Varstvo spomenikov in v različnih arheoloških publikacijah. V Varstvu spomenikov so bile prve objave povedna poročila o raziskavah. Sledili so različni članki, zatem pregledno poročilo ob petdesetletnici revije. Slabe se je izkazal z besedili ob jubilejih kolegov in z izbranimi nekrologi. Brez njega bi konservatorji in bodoče generacije manj vedeli o Cenetu Avguštinu, Emilijanu Cevcu, Jožetu Curku, Viktorju Gojkoviču, Zorku Hareju, Otonu Jugovcu, Francu Kokalju, Marijanu Kolariču, Ljudmili Plesničar, Petru Petruju, Ivanu Pušu, Stojanu Ribnikarju, Nacetu Šumiju, Andreju Valiču, Momu Vukoviću.

Na arheologovem hrbtu so, enako kot pri njegovih kolegih, preizkušali nove pravne in organizacijske sheme. Kljub težavam je Marijan Slabe vztrajal kot kulturni delavec in javna osebnost in se ni nikoli umaknil v kabinetno delo. Konservator Slabe je skupaj z entuziastičnimi sodelavci utiral novo pot, pot regionalnih zavodov za varstvo kulturne in naravne dediščine. Ta kulturna žarišča so iz ljubljanskega in mariborskega zgleda prerasla v uravnoteženo mrežo zgolj sedmih institucij. Praksa jih je sestavila v geografsko in kulturno utemeljeno regionalno mrežo, kakršne na drugih področjih ni znala urediti niti tri desetletja rastoča samostojna država.

Marljivo in poglobljeno delo je Slabe leta 1977 nadgradil z doktorsko disertacijo Draveljska nekropola. Njegove raziskave so bile ključne za tedaj malo znano obdobje preseljevanja ljudstev. Osvetlil je čas propada rimskega imperija in bivanje germanskih ljudstev na obrobju Ljubljane.
Dr. Slabe je leta 1984 prevzel mesto direktorja v Republiškem zavodu za varovanje naravne in kulturne dediščine. Spodbujal je skladen razvoj službe in obeh njenih povezanih stebrov v dobi osamosvajanja države. Delitev ohranjanja dediščine med različna ministrstva v njegovem obdobju ni bilo; zavedal se je nujnosti povezav in ni zapadel v birokratsko eksperimentiranje z različnimi nepreverjenimi shemami. Najvišji mednarodni dokaz povezanosti narave in človekovega sobivanja z njo je bila prva uvrstitev slovenske lokacije na Unescov seznam spomenikov. Škocjanske jame, izjemna kraška celota, imajo tudi pridih pomembnega arheološkega najdišča in etnološkega spomenika. Še v novo tisočletje segajo odmevi zaščite Krasa in priznanja za nesnovno dediščino ob zaščiti lipicancev ter kraških suhozidov. Morda tudi zaradi Slabetove podpore reviji Kras, člankov v njej ali njegove podpore raziskovalcem kraških kamnosekov.

Slabe ni bil nikoli ozko specializiran arheolog. Bil je, podobno kakor prvi konservator Stele, topograf in koordinator; odpiral je obzorja kolegom in laikom. Konservatorski svetnik se je razvil v erudita, ki je odlično poznal Slovenijo, njene griče, skrite arheološke zaklade, stare in nove slovenske knjige ter vse konservatorje. Postal je vodja ali član desetin strokovnih komisij in odborov, ki so usmerjali zaščito dediščine v celoti ali njenih delov. Ko je zapustil mesto direktorja, je postal svetovalec vlade za področje dediščine. Na tem položaju je enako aktivno sodeloval s kolegi znotraj stroke in iz sorodnih disciplin, svetoval mlajšim in skupaj z njimi nadgrajeval ohranjanje kulturne dediščine ter si prizadeval tudi za nujne prve spremembe zakonodaje v novi državi.

Dr. Slabe je bil strokovno podkovan in vedno povezovalno usmerjen konservator svoje generacije, ki je nadgrajevala delo Steletovih učencev – Cevca, Marijana Zadnikarja, Komelja, Šumija – in arheologov, kot so bili njegov profesor Korošec ali generacijska kolega Petru in Gec – Plesničarjeva. Skupaj z Ivanom Stoparjem, inženirjem Ribnikarjem, restavratorjema in kiparjema Kokaljem in Vukovićem ter mlajšimi kolegi je vztrajal pri uravnoteženi vlogi človeka – svetovalca lastnikom in sodelavcem.

Leta 2003 je Slovensko arheološko društvo dr. Slabetu podelilo nagrado za življenjsko delo. Najvišjo konservatorsko Steletovo nagrado pa je za svoje celostno ohranjanje kulturne dediščine prejel že leta 1996. Sledil je svoji misli, zapisani v članku ob petdeseti obletnici revije Varstvo spomenikov: »Ne dovolimo si vzeti vere v cilje, za katere se darujemo s svojim delom in napori.«

Gojko Zupan

V spomin / In memoriam

Ob smrti sodelavca in prijatelja Mirana Eriča - Paca (1959–2023)

Anže in Gašper Košir ter Miran Erič med prevozom na lokacijo srednjeveškega deblaka iz druge polovice 12. ali 13. stoletja v strugi Ljubljanice pri Jurju jeseni 2001 (foto: A. Gaspari)

Mirana Eriča sem spoznal v sredini devetdesetih let prejšnjega stoletja, ko je na Oddelku za arheologijo Filozofske fakultete Univerze v Ljubljani kot mladi raziskovalec na podiplomskem študiju razvijal področje študij lesa iz mokrih okolij in dendrokronologije, tesneje pa naju je povezalo zanimanje za raziskovanje podvodnega sveta. Miran je bil zelo dober potapljač z naravnim talentom za gibanje v podvodju, kot aktiven speleolog in reševalec pa je bil znan tudi po svojih jamskih potopih. Akademsko podprti umetniška nadarjenost in likovna ustvarjalnost sta njegovemu delu na področju grafične obdelave in analitike raziskovalnih podatkov dajali prav posebno vrednost. Miranove dosežke in ekspertizo na področju trirazsežnostne fotogrametrije, s katero se je začel ukvarjati pred dvajsetimi leti kot verjetno prvi na Jadranu, so med drugim cenili tudi kolegi iz Arheološkega muzeja v Zadru, Hrvaškega restavratorskega zavoda in Mednarodnega centra za podvodno arheologijo (ICUA). Posebno pozornost je Miran usmerjal v konserviranje mokrega lesa in študij čolnov izdolbencev, njegove iniciative na tem področju pa so večkrat dobile mednarodno potrditev in priznanje. Miran je imel pri odkrivanju arheoloških ostalin srečno roko, njegovi

posebej odmevni najdbi pa sta paleolitska lesena konica in rimska ladja iz Ljubljanice pri Sinji Gorici. Terensko delo je dosledno zaokrožal s strokovnimi in znanstvenimi članki ter spletnimi objavami. Med slovenskimi kolegi je poznan tudi kot pobudnik in administrator spletne liste Rosa, ki deluje od leta 2009.

Mirana so označevali prijeten značaj in entuziazem na vseh ravneh, pa tudi odprtost in pripravljenost pomagati, kar ga je nedvomno odlikovalo že pri delu, ki ga je v mladosti opravljal kot miličnik. Vznemirjenje ob raziskovanju pod vodo in dogodivščine, ki sva jih pri tem doživela, so naju zelo povezali, in še danes obžalujem, da najinih prizadevanj nisva nadgradila v sistemsko urejeno službo za podvodno arheologijo. Miran si je tega globoko želel in v drugačnih okoliščinah bi lahko imelo njegovo profesionalno delovanje bistveno globlje implikacije za razvoj teh strok. Ne glede na to je bil tudi v letih službovanja na Zavodu za varstvo kulturne dediščine Slovenije prepoznan kot velik ekspert za morfologijo, konserviranje in datiranje predmetov iz lesa ter nepogrešljiv poznavalec številnih programskih okolij in računalniških sistemov v podporo procesom varstva, pa tudi kot sodelavec z bogatimi terenskimi izkušnjami iz podvodnega raziskovanja in trirazsežnostnega dokumentiranja. Svoje delo je opravljal v zasluženem nazivu konservatorski svetnik.

Andrej Gaspari

V Ljubljani, 23. maja 2023

Navodila avtorjem / Instructions to authors

Navodila avtorjem za pripravo prispevkov v reviji Varstvo spomenikov

PREDSTAVITEV

1. Varstvo spomenikov je osrednja slovenska znanstvena strokovna revija za teorijo in prakso spomeniškega varstva. Izdaja jo Zavod za varstvo kulturne dediščine Slovenije
2. Revija izhaja od leta 1946. Do leta 2010 je izhajala z eno številko na leto.
3. Revija se vsebinsko deli na dva dela. V prvem (daljšem) delu so objavljeni prispevki z oznakami COBISS (**C**o-operative **O**nline **Bi**bliographic **S**ystem and **S**ervices) od 1.01 do 1.04, pri čemer pomeni 1.01 izvirni znanstveni članek, 1.02 pregledni znanstveni članek, 1.03 kratki znanstveni prispevek in 1.04 strokovni članek. Prispevki, ki so objavljeni v tem delu revije, so recenzirani in štejejo kot referenčni v domačem in tujih znanstvenih okoljih. Kategorijo prispevka predlaga avtor, končno odločitev pa sprejme uredniški odbor na podlagi predloga recenzenta.

   Drugi (krajši) del, ki sledi prvemu, je namenjen objavi recenzij (oznaka COBISS 1.19), predstavitvam (npr. knjig, projektov, dogodkov, predavanj, konferenc itd.), knjižničnim informacijam idr. Prispevki, ki so objavljeni v tem delu revije, se ne recenzirajo. Prvi del se imenuje Razprave, drugi del pa Predstavitve.

VRSTA, OBSEG IN SESTAVA PRISPEVKOV

4. Številke praviloma niso tematsko usmerjene. Objavljeni so prispevki različnih znanstvenih ved in disciplin (npr. arheologija, etnologija, umetnostna zgodovina, arhitektura, krajinska arhitektura, konservatorstvo, restavratorstvo, geografija ipd.), ki sledijo znanstvenemu in profesionalnemu zanimanju avtorjev za varovanje, raziskovanje in upravljanje kulturne dediščine, mednarodne akte in nacionalno zakonodajo, prostorsko načrtovanje in informatiko na področju spomeniškega varstva, konservatorske študije, zgodovino in doktrino spomeniškega varstva itd.
5. Prispevki v Razpravah so objavljeni v slovenščini in angleščini. Za prevode praviloma poskrbi uredništvo.
6. Razprave praviloma obsegajo največ 1,5 avtorske pole (24 strani po 30 vrstic s 64 znaki oz. 46.000 znakov s presledki), prispevki iz sklopa Predstavitve in informacije pa največ 5 strani (9300 znakov).
7. Sestavine razprav si sledijo v naslednjem zaporedju: naslov prispevka, izjemoma tudi podnaslov, izvleček, ključne besede, besedilo prispevka, ki je razdeljeno na posamezna poglavja (uvod in sklep sta obvezni poglavji), viri in literatura ter povzetek. Naslov in podnaslov članka, ki primerno opisujeta vsebino prispevka, naj natančno, vendar kratko in jedrnato označita bistveno vsebino. V prispevku najpomembnejši obravnavani pojmi naj bodo praviloma navedeni na začetku naslova oziroma podnaslova. Naslov naj ne presega priporočenih 140 znakov. Izvleček naj obsega največ 6–10 vrstic (do 650 znakov). Biti mora razumljiv sam po sebi, brez branja celotnega prispevka; vsebuje naj oris metodologije in rezultatov; uporabljajo naj se celi stavki, izogibati se je treba slabše znanim kraticam in okrajšavam. Kratice naj bodo ob prvi uporabi razvezane v slovenskem jeziku. Če to ni mogoče, kratico razvežemo v jeziku, v katerem je nastala. Ključne besede naj obsegajo 3–8 besed, ki označujejo vsebino prispevka; to naj bodo enostavni izrazi, zapisani v prvem sklonu ednine. Avtor naj poskuša izbrati take ključne besede, ki so že v splošni rabi v sistemu COBISS. Za UDK-vrstilec oz. klasifikacijsko oznako poskrbi uredništvo. Povzetek obsega 30–45 vrstic (največ 1900 znakov). V njem avtor jasno opredeli namene, glavne značilnosti in metodologijo raziskovalnega dela ter najpomembnejše rezultate in sklepe prispevka. Besedilo prispevka mora biti pregledno in razumljivo strukturirano z naslovi poglavij in podpoglavij. Dovoljeni sta največ dve ravni podpoglavij. Avtor lahko priloži tudi kratko zahvalo, ki bo objavljena pred seznamom virov in literature.
8. Zaradi zagotovitve anonimnosti pri recenzijskem postopku mora(-jo) avtor(-ji) svoje ime in priimek navesti posebej, in sicer na prvi strani prispevka. Dopiše(-jo) naj tudi svoj akademski in pedagoški naziv ali znanstveni naziv ter diplomski naziv. Za diplomske nazive naj se uporabljajo uradne okrajšave, za pedagoške in znanstvene nazive pa naj se okrajšave ne uporabljajo. Avtorice naj napišejo svoje pedagoške nazive v ženski obliki (npr. docentka). Sledi naslov institucije, v kateri je avtor zaposlen, oziroma drugi ustrezen naslov in naslov elektronske pošte. Če je avtorjev več, vrstni red določijo sami. Drugih podatkov naj prva stran prispevka ne vsebuje.
9. Za predstavitve knjig in za recenzije (oznaka COBISS 1.19), objavljene v drugem delu revije, mora avtor najprej navesti naslov prispevka. Ta je lahko poljuden in ni nujno, da je povsem enak kot naslov knjige ali dela, ki ga avtor predstavlja oziroma ocenjuje, vendar pa se mora nanašati na vsebino/recenzijo predstavljenega dela oziroma knjige, biti mora čim krajši in čim manj zapleten. Za naslovom mora avtor navesti še: izvirni naslov dela, ime in priimek avtorja(-jev), ime in priimek urednika(-ov), založbo in leto izdaje ter ISBN-številko.

OBLIKOVANJE IN JEZIK PRISPEVKOV

10. Prispevki morajo biti napisani z urejevalnikom besedil Microsoft Word. V celotnem prispevku naj bo uporabljen le en slog, in sicer privzet slog Normal. To pomeni, da morajo imeti prispevki enojni medvrstični razmik, tip črk Times New Roman, velikost črk 12, levo poravnavo in 2,5-centimetrske robove pri formatu A4. Ta normativ je nekoliko drugačen le pri grafičnih prilogah (tip pisave v grafičnih prilogah mora biti Arial, velikost črk pa ne sme biti manjša od 10). Strani v prispevku naj bodo zaporedno oštevilčene, številka strani pa naj bo na dnu strani postavljena na sredino.
11. Besedilo prispevka naj bo preprosto oblikovano. Ni dovoljeno uporabljati zamikov, deljenja besed, podčrtavanja, senčenja ali kakršnih koli drugih načinov oblikovanja, razen označitve krepke in ležeče pisave. Besedilo naj bo v celoti izpisano z malimi črkami (razen velikih začetnic) in naj bo brez nepotrebnih okrajšav. Če se okrajšavam ni mogoče izogniti, naj jih avtor pri prvi navedbi pojasni.
12. Izvirne izraze/termine lahko avtor zapiše ob izrazih, prevedenih v slovenski jezik. Izraz naj avtor zapiše v oklepaju za slovenskim prevodom, pri čemer napiše najprej okrajšavo jezika, v katerem je zapisan izvirni izraz/termin (na primer: angl. (za angleški jezik), nem. (za nemški jezik), fr. (za francoski jezik) itd.), nato izraz/termin, in sicer v ležeči pisavi. Slovenski prevod izraza/termina naj avtor postavi v narekovaje .
13. Pri naštevanju in navajanju enot, ki si v alinejah sledijo druga pod drugo, ni dovoljeno uporabljati funkcije za avtomatsko označevanje in oštevilčevanje, ki jo ima program Microsoft Word. Avtor naj enote, ki si v alinejah sledijo druga pod drugo, številči ali označuje ročno, čeprav zaradi tega besedilo ne bo poravnano v navpični liniji. Enako velja tudi za številčenje naslov, podnaslov, poglavij, podpoglavij, preglednic in slik. Če pri navajanju enot v alinejah avtor ne uporablja številk, naj alineje označi s pomišljaji.
14. Prispevki, objavljeni v slovenščini, morajo biti napisani v slovenskem knjižnem jeziku in ob upoštevanju pravil Slovenskega pravopisa (2003, 2007).
15. Uporaba tujk v prispevkih v slovenskem jeziku je dovoljena le, če ne obstaja primernejši izraz v slovenskem jeziku.

PREGLEDNICE IN GRAFIČNE PRILOGE

16. Za tabele se v prispevku uporablja poimenovanje preglednica. Preglednice so umeščene med besedilo prispevka in ne smejo presegati 2,5-centimetrskega roba. Vsaka preglednica mora biti razumljiva, pregledna in preprosta, brez dodatnega pojasnjevanja in opisovanja. Sestavljajo naj jo vrstice in stolpci, katerih vidne črte se sekajo v poljih. Polj naj avtorji ne senčijo. Preglednice morajo biti zaporedno oštevilčene z arabskimi številkami in morajo imeti naslove. Naslov preglednice naj bo nad preglednico. Med številko in naslovom naj bo dvopičje. Naslovi preglednic naj bodo čim krajši in čim manj zapleteni. Naslov preglednice naj se s piko zaključi le, če gre za stavčno poved. Avtor pod preglednico dopiše tudi vire za podatke v preglednici. Uporabljeni viri morajo biti (v celoti) navedeni v končnem seznamu virov in literature.
17. Za vsako grafično prilogo (fotografija, zemljevid, grafikon, skica in podobno) se uporablja enotno poimenovanje: slika. Slike ne smejo biti umeščene med besedilom prispevka. Oštevilčene morajo biti enotno z arabskimi številkami in morajo imeti naslove. Med številko in naslovom mora biti dvopičje. Naslovi slik naj bodo čim krajši in čim manj zapleteni. Avtor za naslovom dopiše tudi vir(-e) grafične priloge, in sicer na način, kot je za sklicevanje na vire in literaturo med besedilom določeno v teh navodilih. Pri fotografijah in ilustracijah, ki niso vzete iz virov, ampak so avtorsko delo, se za naslovom slike dopišeta ime in priimek avtorja fotografije/ilustracije. Naslov slike se za navedbo virov (ali avtorja fotografije/ilustracije/risbe) s piko zaključi le, če gre za stavčno poved.
18. Če se avtor med besedilom prispevka sklicuje na grafične priloge (npr. jih opisuje, komentira itd.) oziroma če grafična priloga dopolnjuje besedilo prispevka, mora biti v besedilu obvezno navedeno, na katero grafično prilogo se avtor sklicuje, oziroma mora biti na najprimernejšem mestu v besedilu navedeno, katera grafična priloga dopolnjuje besedilo. Pri sklicevanju na grafične priloge je treba uporabljati njihove številke: npr. (sl. 1), kot je razvidno s slike 1, kot prikazuje slika 1 itd.
19. Če sestavlja eno sliko več grafičnih podob (npr. vertikalni in/ali horizontalni niz fotografij, skic, tabel itd.), mora biti vsak posamezen sestavni del slike vidno in jasno oštevilčen. V podpisu k sliki naj avtor zapiše številko posameznega sestavnega dela slike in naslov/pojasnilo tega sestavnega dela slike, in sicer na način, kot je navedeno pri spodnjem primeru. Tak naslov grafične priloge se zaključi s piko.
20. Če vsebuje grafična priloga besedilo (npr. napisi na skicah, legenda v grafikonu, napisi/besedilna navedba enot na abscisnih in ordinatnih oseh v grafikonih ipd.), mora biti to besedilo napisano v slovenščini in angleščini. Napisi naj bodo čim manj zapleteni in čim krajši (npr. če so v grafikonih napisi oziroma besedilne navedbe enot na abscisnih/ordinatnih oseh in na drugih mestih dolgi, je bolj smiselno, da avtor te enote označi s številkami, številke pa pojasni v legendi).
21. Tip pisave v vseh grafičnih prilogah mora biti Arial, črke pa ne smejo biti manjše od 10. Pisava mora imeti enojni medvrstični razmik in levo poravnavo pri formatu A4.
22. Grafične priloge (razen grafikonov) morajo avtorji oddati v digitalni rastrski obliki, z ločljivostjo vsaj 350 pik na palec (350 dpi), in sicer v formatu JPEG (v najvišji kvaliteti) ali TIFF. Širina slike s tako ločljivostjo naj bo najmanj 14,8 cm. Če avtorji ne morejo oddati grafičnih prilog v predpisani obliki, naj se pred oddajo posvetujejo z urednikom.
23. Grafikoni morajo biti izrisani s programom Microsoft Excel.
24. Vsaka grafična priloga mora biti shranjena in oddana uredništvu v svoji datoteki. Naslov posamezne slikovne datoteke naj bo sestavljen le iz priimka (prvega) avtorja, okrajšave sl, podčrtaja in zaporedne številke, ki jo ima slika v besedilu: npr. Fister_sl_1.
25. Avtor naj prostor, ki naj bi ga grafična priloga zasedla v prispevku, šteje v obseg besedila kot 250 besed (pol strani) oziroma 500 besed (cela stran).
26. Avtorji naj bodo zmerni pri številu grafičnih podob, ki jih nameravajo vključiti v prispevek. Vključijo naj le tiste, za katere menijo, da so potrebne za boljše razumevanje vsebine prispevka.

ŠTEVILKE IN MERILA

27. Merske enote naj temeljijo na metričnem merskem sistemu. Pri številih, večjih od 9999, se za ločevanje tisočic in milijonic uporabljajo pike (na primer 13.432 ali 1.514.800). Pri pisanju merila zemljevida se dvopičje piše nestično (na primer 1 : 500.000). Med številkami in enotami je presledek (na primer 135 m, 23,5 %), pred oznako za potenco ali indeksom števila pa presledka ni (na primer 143 km^2, b_g, 17 °C). Znaki pri računskih operacijah se pišejo nestično, razen oklepajev (na primer p = a + c − b − (a + c : b).

OKRAJŠAVE

28. Uporabljajo se slovenske verzije okrajšav in bibliografskih oznak (ur.; idr.; isti.; ista; prav tam).

    Okrajšava prim. se uporablja, kadar želimo opozoriti na stališče, ki je drugačno od našega ali od tistega, ki ga zagovarja avtor druge citirane knjige.

OPOMBE IN NAVAJANJE VIROV IN LITERATURE

29. Bibliografske opombe se pišejo med besedilom, vsebinske opombe pa kot sprotne opombe pod črto.

    Vsebinske opombe, ki vsebujejo dodatno avtorjevo besedilo, so oštevilčene z zaporednimi številkami od začetka do konca besedila. Opombe naj ne bodo predolge.
30. Če je avtor znan, naj bo v besedilu sklic na literaturo tak: (Zadnikar, 1982: 20–23) oziroma npr. Zadnikar (1982) ugotavlja, da ... Če sta avtorja navedenega dela dva, se navedeta oba: (Buser, Cajhen, 1980) oziroma npr. Buser in Cajhen (1980) ocenjujeta, da ... Pri večjem številu avtorjev se zapiše le priimek prvega avtorja, za druge avtorje se navede okrajšava idr., ki pomeni in drugi: (Benedetti idr., 2004) oziroma Benedetti idr. (2004) menijo, da ... Če je avtorjev šest ali manj, se v končnem seznamu virov in literature navedejo vsi avtorji, in sicer tako, kot je določeno v teh navodilih. Če je avtorjev več kot šest, se v končnem seznamu virov in literature navede prvih šest avtorjev, za druge pa se doda okrajšava idr., in sicer tako, kot je določeno v teh navodilih. Če je v prispevku uporabljenih več virov, ki imajo na začetku iste avtorje, je treba med besedilom navajati vse avtorje do vključno prvega različnega.
31. Dela enega avtorja, ki so izšla istega leta, je treba med seboj ločiti z zaporednim dodajanjem malih črk (a, b, c, č itd.) stično ob letnici izida (Božič, 1992a, 1992b) oziroma Božič (1992a, 1992b) navaja ... Tako jih je treba navesti tudi v končnem seznamu virov in literature. Dela različnih avtorjev, ki se vsa nanašajo na isto vsebino, je treba našteti po abecednem redu glede na avtorjev priimek, med posameznimi navedbami je podpičje: (Fister, 1987; Stopar, 1990; Zadnikar, 1975). Pri navajanju več del istega avtorja se navedejo avtor in zaporedne letnice izidov teh del, ki jih je treba ločiti z vejico: (Zadnikar, 1982, 1988). Če v besedilu zaporedno navedemo sklic na isto delo, se pri drugem in vseh nadaljnjih zaporednih sklicih v istem odstavku uporabi navedba: (prav tam). Če je delo še v tisku, se v oklepaju namesto letnice izdaje navede: (v tisku) – na ta način se delo navaja tudi v končnem seznamu virov in literature.
32. Dobesedni navedki morajo biti označeni z narekovaji, in sicer z dvojnimi srednjimi (» «). Stran, na kateri je dobesedni navedek v delu, se napiše za dvopičjem. Pika kot končno ločilo je za oklepajem, v katerem je zapisan vir citata. Če je besedilo citata v citiranem delu na dveh ali več straneh, se med stranema(-nmi) postavi stični pomišljaj (Zadnikar, 1982: 36–37).
33. Daljši dobesedni navedki (več kot 40 besed) naj bodo postavljeni v samostojen odstavek, napisani naj bodo z ležečo pisavo, pred odstavkom in za njim pa naj bo izpuščena po ena vrstica. Začetek in konec dobesednega navedka se v tem primeru ne označujeta z narekovaji. Pika kot končno ločilo je za oklepajem, v katerem je zapisan vir navedbe.
34. Pri dobesednih navedkih, ki imajo vmes posamezne dele izpuščene, se uporablja tropičje v oglatem oklepaju: […]. Za to oznako, če ni bil izpuščen samo del povedi, začnemo pisati ponovno z veliko začetnico. Če v citiranem delu to ni velika začetnica (npr. ker ni začetek stavka), označimo prvo črko z oglatim oklepajem.
35. Pri sklicih na vire, pri katerih avtor in urednik nista znana, se navedeta ime izdajatelja (v prispevkih v angleškem jeziku mora biti v tem primeru ime izdajatelja prevedeno v angleščino) in letnica izdaje dela, npr. za podatke, ki jih objavlja Statistični urad Republike Slovenije, se navede (Statistični urad Republike Slovenije, 2007). Za vire lahko uporabljamo tudi okrajšave, npr. za Statistični urad Republike Slovenije se uporabi okrajšava SURS, vendar mora biti v besedilu prispevka najprej navedeno ime vira v celoti, nato pa mora biti razloženo, da se bo za vir v nadaljevanju uporabljala okrajšava, ki jo avtor tudi razveže. Za navedeni primer (Statistični urad Republike Slovenije, 2007) bi se tako pri sklicu nanj v nadaljevanju uporabljalo (SURS, 2007).
36. Pri navajanju zakonov med besedilom se navedejo ime zakona, številka Uradnega lista Republike Slovenije in letnica, pri čemer se uporablja za Uradni list Republike Slovenije okrajšava: Ur. l. RS, npr. (Zakon o varstvu kulturne dediščine, Ur. l. RS, št. 16/2008). Pri dobesednem navajanju zakonov se doda še stran v Uradnem listu RS.
37. Če imajo zakoni uradne okrajšave, npr. ZVKD-1, se lahko te uporabijo, vendar mora biti v besedilu članka najprej navedeno ime zakona v celoti, nato pa mora biti razloženo, da se bo za ta vir v nadaljevanju uporabljala okrajšava, ki jo avtor tudi navede.

SEZNAM UPORABLJENIH VIROV IN LITERATURE

38. Vsa dela (viri in literatura), navedena v članku, morajo biti v abecednem seznamu navedena na koncu v sestavnem delu prispevka z naslovom Viri in literatura. Seznama avtor ne sme številčiti ali kakor koli drugače označevati (s pikami, pomišljaji). V primerih navedb, ki so prikazani spodaj, so ločila in oblika pisave (ležeče oziroma pokonci) navedeni točno tako, kot jih mora navesti tudi avtor v svojem prispevku.

Monografije in knjige (en avtor)

Fister, P. (1986): *Umetnost stavbarstva na Slovenskem*. Ljubljana, Cankarjeva založba.

Opomba: Priimek avtorja, Inicialka(-e) avtorjevega imena. (letnica izdaje dela): *Naslov dela: Morebitni podnaslov*. Kraj izdaje, Založba.

Monografije in knjige (od tri do šest avtorjev)

Pernet, L., Carlevaro, E., Tori, L., Vietti, G., Della Casa, P., in Schmid-Sikimić, B.

(2006): *La necropoli di Giubiasco (TI): Vol. II, Les Tombes de La Tène finale et d'époque romaine*, Collectio archaeologica 4. Zürich, Musée national suisse.

Opomba: Če je avtorjev šest ali manj, se v končnem seznamu virov in literature navedejo vsi avtorji. Če je avtorjev več kot šest, se našteje prvih šest, nato pa sledi okrajšava idr.

Monografije in knjige (avtorji niso znani, znan je urednik)

Dromgoole, S. (ur.) (2006): *Legal protection of the Underwater Cultural Heritage: National perspectives in Light of the UNESCO Convention 2001.* Leiden, Martinus Nijhoff.

Diplomska in magistrska dela, doktorske disertacije, raziskovalna poročila

Uhač, M. (2003): *Brodolom na rtu Savudrija.* Diplomska naloga. Sveučilište u Zadru.
Verbič, T. (2008): *Poročilo o ogledu arheoloških izkopavanj na lokaciji NUK 2.* Raziskovalno poročilo. Ljubljana, Zavod za varstvo kulturne dediščine Slovenije, Območna enota Ljubljana.

Prispevki ali poglavja v monografijah, knjigah, enciklopedijah in zbornikih konferenc, zborovanj, seminarjev itd.

Dumont, A. (2000): Etat d'un cours d'eau à la fin du 18e siècle : la visite de la rivière d'Ourthe (Belgique). V: Bonnamour, L. (ur.): *Archéologie des fleuves et des rivières*, str. 25–27. Pariz, Éditions Errance.

Opomba: pri zbornikih konferenc, zborovanj, seminarjev itd. naj avtor ne navaja, za katero konferenco, zborovanje, seminar itd. gre, kje in kdaj je tovrstno druženje potekalo in kakšen je bil njegov naslov. Z ležečo pisavo je napisan naslov knjige, monografije, zbornika.

Prispevki v monografijah, ki izhajajo v seriji z lastnim naslovom

Svetličič, V. (1997): Drobne najdbe iz kovine, jantarja in roževine. V: Horvat, J.: *Sermin.* Opera Instituti Archaeologici Sloveniae, 3, str. 31–38. Ljubljana, Založba ZRC.

Opomba: za naslovom knjige zapišemo tudi naslov serije in številko zvezka (če je zbirka oštevilčena). Oštevilčenje je vedno zapisano v arabskih številkah, tudi če so v knjigi rimske številke. Prav tako izpuščamo oznako za zvezek pred številko *(Band, Heft, Vol., No.).*

Prispevki v periodičnih publikacijah

Delak Koželj, Z. (2008): Programski model delovanja etnologa konservatorja. *Varstvo spomenikov*, 44, str. 256–262.
Raban, A. (1992): Archaological Park for Divers at Sebastos and Other Submerged Remnants in Caesarea Maritima. *International Journal of Nautical Archaeology*, 21(1), str. 27–35.

Opomba: število 21 v oznaki 21(1) je letnik publikacije, 1 pa številka v posameznem letniku. Če publikacija nima številke (npr. če izide le ena publikacija v enem letniku), naj avtor napiše le letnik, vendar ne v oklepaju. Imena revij ni dovoljeno pisati z okrajšavami, napisana pa morajo biti z ležečo pisavo.

Gesla v enciklopedijah in leksikonih

Slovenski biografski leksikon, s. v. "Turner Pavel".
Ulčar, M. (1995): *Enciklopedija orožja: Orožje skozi sedem tisočletij.* Ljubljana, Državna založba Slovenije, s. v. "Enostrelne zadnjače".

Opomba: pri citiranju gesel razširjenih enciklopedij in leksikonov pišemo le naslov (ležeče) in pa izdajo, če jih je na voljo več, ni pa treba zapisati število zvezkov niti kraja in leta izida. Naslovu sledita kratica s. v. (iz latinskega *sub verbo* – pod besedo) ter citirano geslo v narekovajih in pokončnem tisku.
Kadar navajamo podatke iz manj znanega leksikona ali enciklopedije, moramo seveda v opombo zapisati vse podatke, ki jih pišemo pri monografskih delih.

Prispevki v dnevnih časopisih

Petkovšek, J. (2009): Potrebujemo zakon, ne le odlok. *Delo*, 51(24), 30. 1. 2009, str. 9.

Zakoni

Zakon o varstvu kulturne dediščine. Uradni list RS, št. 16/2008. Ljubljana.

Publikacije, katerih avtor in urednik nista znana – npr. statistični viri, enciklopedije, zemljevidi

Statistični urad Republike Slovenije (2007): *Statistični letopis 2007.* Ljubljana.

Opomba: najprej je naveden izdajatelj, sledijo leto izdaje, naslov dela in kraj izdaje. V prispevkih v angleškem jeziku morata biti v tem primeru ime izdajatelja in naslov dela prevedena v angleščino.

Rokopisi in tipkopisi, ki niso objavljeni, vendar je letnica nastanka znana

Plesničar – Gec, L. (2000): *Emonski teater*. Tipkopis.

Opomba: najprej je naveden avtor rokopisa/tipkopisa, sledijo letnica in naslov ter podatek, da gre za rokopis/tipkopis.

Rokopisi in tipkopisi, ki niso objavljeni, letnica nastanka pa tudi ni znana

Snoj, D. (1999): *Poročilo o zaščitnih izkopavanjih na lokaciji NUK II*. Tipkopis (prejeto 24. 1. 1999).

Opomba: najprej je neveden avtor rokopisa/tipkopisa, sledijo letnica (kot letnica se navede leto, ko je avtor prispevka vir prejel), naslov, podatek, da gre za rokopis/tipkopis, v oklepaju pa je natančen datum prejetja dela.

Intervjuji, pogovori

Svetina, T. (1995): *Marijina kapelica na Mlinem pri Bledu* (osebni vir 25. 3. 1995).

Opomba: navedejo se intervjuvanec, leto intervjuja, kot naslov pa vsebina intervjuja. V oklepaju je natančen datum izvedbe intervjuja/pogovora.

Splošne opombe

- Če je delo še v tisku, se v oklepaju namesto letnice izdaje navede: (v tisku) – na ta način se delo navaja tudi med besedilom.
- Če je krajev izdaj več, mora avtor navesti enega od njih.
- Če je založnik fakulteta ali oddelek na fakulteti, je treba za krajem izdaje dela najprej navesti univerzo, nato fakulteto in na koncu morebitni oddelek.
- Če sta avtorja dva ali jih je več, se v končnem seznamu virov in literature navedba dela začne vedno s tistim avtorjem, ki je (kot prvi) naveden tudi med besedilom.
- Če isti avtor nastopa enkrat samostojno, enkrat pa kot prvi avtor v skupini več avtorjev, potem v seznamu virov in literature najprej navajamo njegova samostojna in nato skupinska dela; slednja razvrstimo po abecedi glede na priimek drugega (ali po potrebi tretjega) avtorja. Če se isti avtor pojavi večkrat, dela navajamo po letu izdaje – najprej starejša in nato novejša dela.
- Če je naslov citiranega dela v dveh ali več jezikih ali če je celotni prispevek v dveh ali več jezikih, mora avtor za prvo napisanim naslovom zapisati še naslove dela v drugem(-ih) jeziku(-ih), in sicer znotraj oglatih oklepajev. Če je teh naslov več, jih mora med seboj ločiti s poševno črto (/), pri čemer pred njo in za njo ne sme pustiti presledka. Če je dvo- ali večjezični prispevek v publikaciji objavljen na različnih mestih, morajo biti številke strani navedene za vsakega posebej, kot je prikazano v spodnjem primeru:
  Horvat, J. (2002): The Hoard of Roman Republican Weapons from Grad near Šmihel [Zaklad rimskega republikanskega orožja z Gradu pri Šmihelu pod Nanosom]. *Arheološki vestnik*, 53, str. 117–150 [150–192].
- Navedba strani se piše s stičnim pomišljajem; avtor naj bo pozoren, da uporablja pomišljaj (–) in ne vezaj (-).
- Vsaka navedba vira se konča s piko.

39. Pri navajanju arhivskih virov je treba v oklepaju navesti ime arhiva ali njegovo okrajšavo, ime fonda in njegovo signaturo, oznako tehnične enote (številko fascikla ali škatle) ter naslov in številko navajanega dokumenta, vse ločeno z vejicami. Poleg tega je – če je to mogoče – smiselno navesti še podatke, ki so na citirani arhivaliji, npr. številko in datum izdaje akta.

Primer navedbe arhivskega vira

Arhiv Republike Slovenije (ARS), Vicedomski urad za Kranjsko, AS 1, šk. 1, akt 942.

40. Vire s svetovnega spleta navajamo, kot je prikazano spodaj. Vedno na koncu navedemo tudi datum, ko je bil vir dostopen na spletu.

Primer navedbe spletnega vira, če je avtor znan

Avramov, D. (2006): Social exclusion and social security. http://www.avramov.org/documents/document7.pdf (dostop 20. 2. 2008).

Primer navedbe spletnega vira, če avtor ni znan

Internet 1: http://www.international.icomos.org/charters.htm (dostop 15. 9. 2008).

Opomba: v prvem primeru se med besedilom navede (Avramov, 2006), v drugem primeru pa (internet 1, 2 ...).

41. Seznam virov in literature vključuje le dela, ki so dejansko navedena v besedilu prispevka. Vsako enoto v teh seznamih zaključuje pika.

RECENZENTSKI POSTOPEK, LEKTURA IN AVTORSKE PRAVICE

42. Uredništvo sprejema prispevke vse leto. Prispevke morajo avtorji poslati po pošti na naslov uredništva

Zavod za varstvo kulturne dediščine Slovenije
Varstvo spomenikov – uredništvo
Poljanska cesta 40
SI–1000 Ljubljana

43. Grafične priloge morajo biti v končni obliki shranjene v podatkovni mapi, ločeno od besedila prispevka.
44. Uredništvo ima pravico, da prispevkov, ki niso v celoti pripravljeni v skladu z navodili za objavo v reviji Varstvo spomenikov, ne sprejme v recenzentski postopek.
45. Uredništvo ima pravico, da prispevkov, ki niso napisani v slovenskem knjižnem jeziku, ne sprejme v recenzentski postopek.
46. Z rezultatom recenzije članka bo avtor seznanjen najpozneje v treh mesecih od oddaje članka. Če recenzent predlaga spremembe oziroma izboljšave, se članek vrne (prvonapisanemu) avtorju. Morebitne popravke ali spremembe lahko sočasno predlaga tudi uredništvo. Avtor vnese predlagane recenzentove in/ali urednikove popravke in vrne popravljeno besedilo v petih dneh. Vnesene popravke in spremembe preveri urednik. Dovoljeni so le popravki in spremembe, ki jih zahtevata recenzent in/ali urednik.
47. Če recenzija ne zahteva popravka ali dopolnitve članka, se avtorju recenzija ne pošlje. V tem primeru uredništvo pošlje (prvemu) avtorju le obvestilo, da bo prispevek objavljen.
48. O uvrstitvi objavljenih prispevkov v eno od tipologij dokumentov/del v bibliografskem sistemu COBISS odloča recenzent. Urednik preveri pravilnost odločitve recenzenta. Če se mu zdi recenzentova uvrstitev sporna, se glede uvrstitve dogovorita skupaj. O uvrstitvi nerecenziranih prispevkov v eno od tipologij COBISS-a odloča urednik.
49. Pred objavo so vsi prispevki, ki so napisani in oddani v slovenskem jeziku, še lektorirani. Avtorju se lektorirano besedilo pošlje v dopolnitev le, če lektor predlaga večje popravke oziroma vstavi svoje komentarje/pripombe, ki so povezani s strokovno vsebino. V takih primerih avtor popravi ali izboljša besedilo v skladu z lektorjevimi pripombami/komentarji in vrne popravljeno besedilo v treh dneh.
50. Prevod se opravi po recenzentskem postopku oziroma po vnosu morebitnih recenzentovih in/ali urednikovih popravkov in pregledu morebitnih predlaganih večjih lektorjevih popravkov oziroma komentarjev/pripomb.

    Za zagotovitev brezhibnosti prevoda prevedene prispevke pred objavo pregleda oseba, ki uporablja angleščino kot svojo materinščino. Če so predlagani manjši popravki, se prevod avtorju ne vrača, ampak uredništvo vnese popravke na podlagi predlogov govorca materinščine. Če je ugotovljeno, da je prevod jezikovno problematičen, uredništvo poskrbi za njegovo profesionalno lektoriranje. Avtor vrne lektorirano besedilo prevoda v petih dneh. Dopolnjeno besedilo prevoda se še enkrat jezikovno pregleda. Prispevek je objavljen, ko je potrjeno, da prevod ustreza pravopisnim pravilom angleškega jezika in pravilom v teh navodilih.
51. Tuji avtorji se za prevod prispevkov iz angleščine v slovenščino dogovorijo z urednikom. Prispevek morajo oddati v brezhibni angleščini. Tudi te prispevke jezikovno pregleda oseba, ki uporablja angleščino kot svojo materinščino.
52. Uredniški odbor lahko na predlog urednika ali recenzenta zavrne objavo prispevka.
53. Sprejeti bodo samo prispevki, ki še niso bili objavljeni. Če je isti prispevek že v postopku objave v drugi reviji, mora avtor to izrecno navesti.
54. Za avtorsko delo, poslano za objavo v Varstvu spomenikov, vse moralne avtorske pravice pripadajo avtorju, materialne avtorske pravice reproduciranja in distribuiranja v Republiki Sloveniji in v drugih državah pa avtor brezplačno, enkrat za vselej, za vse primere, za neomejene naklade in za vse medije neizključno prenese na izdajatelja.
55. Avtorji so za objavo grafičnih prilog, za katere nimajo avtorskih pravic, dolžni pridobiti dovoljenje in ga poslati na naslov uredništva.
56. Za vse trditve v prispevku odgovarja avtor sam, zato objavljamo le podpisane prispevke.
57. Ob izidu prejme vsak avtor članka in vsak recenzent en brezplačen izvod publikacije. Članki niso honorirani.

Instructions to authors for the drafting of articles in *Varstvo spomenikov*

PRESENTATION

1. *Varstvo spomenikov* is Slovenia's main academic and professional journal devoted to the theory and practice of monument protection. It is published by the Institute for the Protection of Cultural Heritage of Slovenia.
2. The journal first appeared in 1946, with one issue published a year up to 2010.
3. The journal is divided into two parts. The first (longer) part contains articles classified according to the COBISS (**Co**-operative **O**nline **Bi**bliographic **S**ystem and **S**ervices) typology under codes 1.01 to 1.04, where 1.01 means original scientific article, 1.02 means review article, 1.03 means short scientific article and 1.04 means professional article. The articles published in this part of the journal are peer-reviewed and are counted as reference articles in domestic and foreign academic environments. The category of the article is proposed by the author but the final decision is taken by the editorial board on the basis of the reviewer's proposal.

   The second (shorter) part, which follows the first, contains reviews (COBISS code 1.19), presentations (of books, projects, events, lectures, conferences, etc.), library information, etc. Articles published in this part of the journal are not subject to peer review. The first part of the journal is called *Razprave* [Papers] and the second *Predstavitve* [Presentations]

TYPE, LENGTH AND STRUCTURE OF ARTICLES

4. The individual issues of the journal are not as a rule thematically oriented. The journal publishes articles from various fields and disciplines (archaeology, ethnology, history of art, architecture, landscape architecture, conservation, restoration, geography, etc.) which follow the scholarly and professional interest of their authors in the protection, research and management of cultural heritage, international acts and national legislation, spatial planning and information technology in the monument protection field, Conservation studies, monument protection history and doctrine, etc.
5. Articles in the *Razprave* section are published in Slovene and English. As a rule translations are arranged by the editorial office.
6. Papers should not exceed 24 pages (30 lines, 64 characters per line) or 46,000 characters with spaces. Articles from the *Predstavitve* section should not exceed 5 pages (9,300 characters).
7. The contents of papers should follow this sequence: title, subtitle (where appropriate), abstract, keywords, text divided into individual chapters (including an introduction and conclusion), list of references and summary. The title and subtitle of the article should accurately but concisely indicate the essential content. As a rule, the most important concepts dealt with in the article should be indicated at the start of the title or subtitle. The maximum recommended length of titles is 140 characters. The abstract should be no more than 6–10 lines long (up to 650 characters). It must be self-explanatory and intelligible to someone who has not read the whole article; it should contain an outline of the methodology used and results obtained; whole sentences should be used and little-known abbreviations should be avoided. Abbreviations should be explained in Slovene at first use. If this is not possible, the abbreviation should be explained in the language in which it originates. Keywords should consist of 3–8 words indicating the content of the article; these should be simple expressions in the nominative singular case. The author should attempt to select keywords that are already in general use in the COBISS system. The UDC call number or classification shall be provided by the editorial office. The summary should be 30–45 lines long (maximum 1,900 characters). In it, the author shall define the purposes, main characteristics and methodology of the research work and the most important results and conclusions of the article. The text of the article must be clearly and intelligibly structured with titles of sections and subsections. A maximum of two levels of subsections (subsections and sub-subsections) are permitted. The author may also include a short acknowledgements section which will be published before the list of references.
8. In order to guarantee anonymity during the peer-review process, the name(s) of the author(s) should only appear on a separate cover page. Titles and degrees should be included. Official abbreviations should be used for degrees but titles are not abbreviated. Female authors should use the female form of their title (e.g. *docentka*). The cover page should also state the address of the institution where the author is employed (or other appropriate address) and an e-mail address. If the article is the work of more than one author, the authors themselves shall determine the order in which their names appear. The cover page should not contain other information.
9. For book presentations and reviews (COBISS code 1.19) published in the second part of the journal, the author must first indicate the title of the article. This does not necessarily have to be the same as the title of the book or work which the author is presenting or reviewing but must relate to the content/review of the presented work or book and should be as brief and uncomplicated as possible. Following the title, the author must also indicate: the original title of the work, the name of the author(s), the name of the editor(s), the publisher and the year of publication, and the ISBN number.

FORMATTING AND LANGUAGE OF ARTICLES

10. Articles must be written in Microsoft Word format. Only one style should be used throughout the article – the default Normal style. This means that articles must have the following characteristics: line spacing: single; font: Times New Roman; font size: 12 pt; alignment: left; margins: 2.5 cm; A4 format. These rules change slightly in the case of illustrations and tables, where the font must be Arial and the font size must not be smaller than 10 pt. The pages of the article should be numbered in sequence and the page number should appear at the bottom of the page (centred).
11. The text of the article should use simple formatting. The use of indentations, hyphenation, underlining, shading or any other forms of formatting except the use of bold and italics is not permitted. The entire text should be lower-case (with the exception of initial capitals) and should contain no unnecessary abbreviations. If abbreviations cannot be avoided, the author should explain them at first use.
12. The author may include original expressions/terms alongside expressions translated into Slovene. The author should include the expression in brackets after the Slovene translation, following an abbreviation indicating the language of the original expression/term (e.g. Eng. for English, Ger. for German, Fr. for French, etc.) and then the expression/term in italics. The Slovene translation of the expression/term should be placed in inverted commas.
13. Do not use the automatic bullets and numbering functions in Microsoft Word to list items. Items in a list should be numbered or marked manually even though this means that the text will not be aligned vertically. The same applies to numbering the title, subtitle, sections, subsections, tables and figures. If numbers are not used to indicate the items in a list, dashes should be used instead.
14. Articles published in Slovene must be written in standard literary Slovene and observe the rules of Slovene usage as set out in *Slovenski pravopis* (2003, 2007).
15. The use of foreign words in articles written in Slovene is only permitted if a more suitable expression does not exist in Slovene.

TABLES AND ILLUSTRATIONS

16. Tables in the article shall be referred to (in articles written in Slovene) by the expression *preglednica*. Tables are incorporated into the text of the article and must not extend beyond the 2.5-centimetre margin. Each table must be intelligible, clear and simple, without additional explanation or description. Tables should consist of rows and columns intersecting in cells. Cells should not be shaded. Tables must be numbered in sequence with Arabic numerals and must have titles. The title of the table should appear above the table. The number and title of the table should be separated by a colon. Titles of tables should be as short and simple as possible. The title of a table should only end with a full stop if it is a full sentence. The author must cite the sources of the data in the table below the table. The sources used must be listed (in full) in the list of references at the end of the article.
17. The uniform designation 'Figure' shall be used for all types of illustration (photographs, maps, graphs, sketches, etc.). Figures must not be embedded in the text of the article. They must be numbered in sequence with Arabic numerals and must have titles. The number and title should be separated by a colon. Titles of figures should be as short and simple as possible. The author shall also include the source(s) of the illustration in the manner set out in these instructions for in-text citation of sources and references. In the case of original photographs and illustrations not taken from sources, the name of the photographer/illustrator shall be given after the title of the figure. The title of the figure shall only end with a full stop placed after the citation of sources (or the name of the photographer/illustrator) in the case of a full sentence.
18. If the author refers in the text to a figure (describes it, comments on it, etc.) it must be stated in the text what figure the author is referring to; if a figure complements the text of the article, the figure complementing the text must be indicated at the most appropriate point in the text. When referring to figures in the text, their numbers should be used, e.g. '(Fig. 1)', 'as can be seen from Figure 1', 'as shown by Figure 1', etc.
19. If a figure consists of more than one image (e.g. a vertical and/or horizontal sequence of photographs, sketches, tables, etc.), each individual element of the figure must be visibly and clearly numbered. The caption to the figure must include the number of the individual element of the figure and the title/explanation of this element, in the manner indicated in the example below. Such a title shall end with a full stop.
20. If an illustration contains text (e.g. labels on sketches, legends on graphs, labels/textual indications of units on the X and Y axes of graphs, etc.), this text must be given in Slovene and English. Labels should be as simple and as short as possible (if labels or textual indications of units on the X and Y axes of graphs and elsewhere are long, it is better to label these units with numbers and explain the numbers in a legend).
21. The font used in all illustrations must be Arial and the font size must be no smaller than 10 pt. Single line spacing, left alignment and A4 format must be used.
22. Illustrations (with the exception of graphs) must be delivered as bitmap images with a resolution of at least 350 dpi (dots per inch), in JPEG (highest quality) or TIFF format. The width of an image at this resolution should be at least 14.8 cm. If authors are unable to submit illustrations in the prescribed form, they should consult the editor before submission.
23. Graphs must be in Microsoft Excel format.
24. Each illustration must be saved and submitted to the editorial office in its own file. The filename of an individual image file must have the following format: surname of (first) author, underscore, abbreviation 'sl', underscore, number of the figure in the text, e.g. **Fister_sl_1**.
25. The author should count the space that the illustration will occupy in the article as an amount of text, in other words 250 words (half a page) or 500 words (whole page).
26. Authors should be moderate in their use of illustrations in the article. They should only use those they consider necessary to aid understanding of the content of the article.

NUMBERS AND MEASUREMENTS

27. Metric measurements should be used. In the case of numbers greater than 9999, commas should be used to separate thousands and millions (for example 13,432 or 1,514,800). When giving the scale of a map, a space should be used either side of the colon (for example 1 : 500,000). Numbers and units are separated by a space (for example 135 m, but 23.5‰), but a space is not used before superscripts or subscripts indicating powers or indices (for example 143 km^2, b_s, 17 °C). Symbols in mathematical operations are separated by spaces, except brackets (e.g. p = a + c − b − (a + c : b).

ABBREVIATIONS

28. The Slovene versions of abbreviations and bibliographic references (ur.; idr.; isti.; ista; prav tam) shall be used in articles written in Slovene.

    The abbreviation 'prim.' (cf.) is used to draw attention to a view which differs from that of the author or from that of the author of another cited work.

NOTES AND REFERENCES

29. Bibliographic references shall be given in the text. Explanatory notes shall be given as footnotes. Footnotes containing additional text by the author shall be numbered consecutively from the beginning to the end of the text. Footnotes should not be too long.
30. Where the cited author is known, the bibliographic reference in the text should be as follows: (Zadnikar, 1982: 20–23) or, for example, 'Zadnikar (1982) states that...' Where a cited work has two authors, both are cited: (Buser, Cajhen, 1980) or, for example, 'Buser and Cajhen (1980) consider that...' In the case of works by several authors, only the surname of the first author is given, and the abbreviation et al. (meaning 'and others') is used for the other authors: (Benedetti et al., 2004) or 'Benedetti et al. (2004) believe that...' If there are six or fewer authors, all six are cited in the list of references at the end of the article, in the manner specified in these instructions. If there are more than six authors, the list of references at the end of the article cites the first six authors and adds the abbreviation et al. for the others, as specified in these instructions. If the article uses multiple sources with the same initial authors, all the authors up to and including the first different author must be cited in the text.
31. Works by one author published in the same year must be distinguished by the addition of lowercase letters (a, b, c, d, etc.) closed up to the year of publication e.g. '(Božič, 1992a, 1992b)' or 'Božič (1992a, 1992b) mentions that...' This is also how they must be cited in the list of references at the end of the article. Works by different authors all of which relate to the same content should be cited in alphabetical order of the author surname, separated by semicolons: (Fister, 1987; Stopar, 1990; Zadnikar, 1975). When citing two or more works by the same author, cite the author and the years of publication of these works in chronological order, separated by a comma: (Zadnikar, 1982, 1988). If the text contains consecutive references to the same work, the abbreviation *ibid.* is used in the second and all subsequent consecutive references in the same paragraph. If a work is still in the process of being published, use the wording 'in press' in brackets instead of the date of publication – this is also the way to cite the work in the list of references at the end of the article.
32. Quotations should be placed inside single inverted commas. The page on which the quotation appears in the work is indicated after a colon. A full stop is placed as final punctuation after the bracket containing the source of the quotation. If the text of the quotation in the cited work is on two or more pages, an unspaced dash is placed between the page numbers (Zadnikar, 1982: 36–37).
33. Longer quotations (over 40 words) should be placed in a separate paragraph and written in italics. A blank line should be left before and after this paragraph. In this case inverted commas are not used to mark the start and finish of the quotation. A full stop is placed as final punctuation after the bracket containing the source of the quotation.
34. In the case of quotations in which words/sections are omitted, omissions are indicated by an ellipsis in square brackets: [...]. This symbol is followed by a capital letter, unless only part of a sentence is omitted. If a capital letter does not appear at this point in the quoted work (e.g. because it is not the beginning of a sentence), the first letter is enclosed in square brackets.
35. In references to sources of which the author and editor are unknown, the name of the publisher (in articles in English the name of the publisher must in this case be translated into English) and the year of publication of the work are cited. For data published by the Statistics Office of the Republic of Slovenia, for example, the citation should be as follows: (Statistics Office of the Republic of Slovenia, 2007). Abbreviations may also be used for sources, e.g. SURS for the Statistics Office of the Republic of Slovenia, but the name of the source must first be given in full in the text of the article, followed by an explanation that from this point on an abbreviation, which must be specified, will be used for this source. For the above example (Statistics Office of the Republic of Slovenia, 2007), further references to it will use (SURS, 2007).
36. When citing laws in the text, the name of the law, the number of the Official Journal of the Republic of Slovenia and the year shall be given, where the abbreviation OJ RS shall be used for the Official Journal of the Republic of Slovenia, for example: (Cultural Heritage Protection Act, OJ RS, No 16/2008). When quoting directly from laws, the page number in the OJ RS is added.
37. If laws have official abbreviations, for example ZVKD-1, these may be used, but the name of the law must first be given in full in the text of the article, followed by an explanation that from this point on an abbreviation, which must be specified, will be used for this source.

LIST OF REFERENCES

38. All works (sources and references) cited in the article must be listed in alphabetical order at the end of the article in a section entitled References. The list of authors must not be numbered or otherwise labelled (with bullets, dashes, etc.). In the case of the citations shown below, the punctuation marks and font style (italic or regular) are given exactly as they must

be given by the author in his/her article.

Monographs and books (single author)

Fister, P. (1986): *Umetnost stavbarstva na Slovenskem*. Ljubljana, Cankarjeva založba.

Note: Author's surname name, Author's initial(s). (year of publication): *Title: Subtitle if any.* Place of publication, Publisher.

Monographs and books (three to six authors)

Pernet, L., Carlevaro, E., Tori, L., Vietti, G., Della Casa, P., and Schmid-Sikimić, B. (2006): *La necropoli di Giubiasco (TI): Vol. II, Les Tombes de La Tène finale et d'époque romaine*, Collectio archaeologica 4. Zurich, Swiss National Museum.

Note: If there are six or fewer authors, all authors are listed in the list of references. If there are more than six authors, the first six are given and then the abbreviation 'et al.'

Monographs and books (authors not known, editor known)

Dromgoole, S. (ed.) (2006): *Legal Protection of the Underwater Cultural Heritage: National Perspectives in Light of the UNESCO Convention 2001.* Leiden, Martinus Nijhoff.

Undergraduate theses, master's theses, doctoral dissertations, research reports

Uhač, M. (2003): *Brodolom na rtu Savudrija.* Undergraduate thesis. University of Zadar.
Verbič, T. (2008*): Poročilo o ogledu arheoloških izkopavanj na lokaciji NUK 2.* Research report. Ljubljana, Zavod za varstvo kulturne dediščine Slovenije, Območna enota Ljubljana.

Papers or chapters in monographs, books, encyclopaedias and proceedings of conferences, conventions, seminars, etc.

Dumont, A. (2000): Etat d'un cours d'eau à la fin du 18e siècle : la visite de la rivière d'Ourthe (Belgique). In: Bonnamour, L. (ed.): *Archéologie des fleuves et des rivières*, 25–27. Paris, Éditions Errance.

Note: In the case of proceedings of conferences, conventions, seminars, etc., the author does not state the name of the conference, convention, seminar, etc. or where and when it took place. The title of the book, monograph or proceedings is given in italics.

Papers in monographs published in a series with its own title

Svetličič, V. (1997): Drobne najdbe iz kovine, jantarja in roževine. In: Horvat, J.: *Sermin*. Opera Instituti Archaeologici Sloveniae, 3, 31–38. Ljubljana, Založba ZRC.

Note: the title of the book is followed by the title of the series and the number of the volume (if the collection is numbered). Numbering is always given in Arabic numerals even if Roman numerals are used in the book. The volume designation (*Band, Heft, Vol., No* etc.) before the number is also omitted.

Articles in periodicals

Delak Koželj, Z. (2008): Programski model delovanja etnologa konservatorja. *Varstvo spomenikov*, 44, 256–262.
Raban, A. (1992): Archaological Park for Divers at Sebastos and Other Submerged Remnants in Caesarea Maritima. International Journal of Nautical Archaeology, 21(1), 27–35.

Note: the numeral 21 in 21(1) refers to the year of publication while the numeral 1 is the number of the issue in that year. If the publication does not have an issue number (for example a single annual publication), the author merely gives the number referring to the year of publication, but not in brackets. Names of publications must not be given in abbreviated form and must be given in italics.

Entries in encyclopaedias and lexicons

Slovenski biografski leksikon, s. v. 'Turner Pavel'.
Ulčar, M. (1995): *Enciklopedija orožja: Orožje skozi sedem tisočletij.* Ljubljana, Državna založba Slovenije, s. v. 'Enostrelne zadnjače'.

Note: when citing entries from well-known encyclopaedias and lexicons, only the title (in italics) and the edition (in the case of there being more than one) are given. It is not necessary to state the volume number or the place and year of publication. The title is followed by the abbreviation s.v. (from the Latin *sub verbo* meaning under the word or heading) and the cited entry in inverted commas. Italics are not used for the cited entry.
When citing information from a less well-known lexicon or encyclopaedia, the reference must of course include all the information given in the case of monographic works.

Articles in daily newspapers

Petkovšek, J. (2009): Potrebujemo zakon, ne le odlok. *Delo*, 51(24), 30. 1. 2009, 9.

Laws

Protection of Cultural Heritage Act. OJ RS, No 16/2008. Ljubljana.

Publications of which the author and editor are unknown – for example statistical sources, encyclopaedias, atlases

Statistics Office of the Republic of Slovenia (2007): *Statistični letopis 2007.* Ljubljana.

Note: the publisher is given first, followed by the year of publication, the title of the work and the place of publication. In articles in English, the name of the publisher and the title of the work must be translated into English in this case.

Unpublished manuscripts and typescripts of which the date of writing is known

Plesničar-Gec, L. (2000): *Emonski teater*. Typescript.

Note: the name of the author of the manuscript/typescript is given first, followed by the date of writing, the title and an indication that it is a manuscript/typescript.

Unpublished manuscripts and typescripts of which the date of writing is not known

Snoj, D. (1999): *Poročilo o zaščitnih izkopavanjih na lokaciji NUK II*. Typescript (received 24. 1. 1999).

Note: the name of the author of the manuscript/typescript is given first, followed by the date (in this case the year that the author of the article received the source), the title, an indication that it is a manuscript/typescript, and in brackets are the exact date on which the work was received.

Interviews, conversations

Svetina, T. (1995): *Marijina kapelica na Mlinem pri Bledu* (personal source 25. 3. 1995).

Note: the reference consists of the name of the interviewee, the year of the interview and, as a title, the content of the interview. The exact date of the interview/conversation is given in brackets.

General remarks

- If a work is still in the process of being published, use the wording 'in press' in brackets instead of the year of publication – this is also the way to cite the work in the text.
- If there is more than one place of publication, the author must cite at least one of them.
- If the publisher is a university faculty or a department thereof, following the place of publication the name of the university must be given first, followed by the faculty and then the department if applicable.
- If there are two or more authors, the reference in the list of references at the end of the article always starts with the author cited (first) in the text.
- If the same author appears both as the sole author of a work and as the first author in a group of authors, the works of which he/she is sole author appear before the group works in the list of references; the latter are arranged alphabetically by the surname of the second author (or if necessary the third). If the same author appears several times, works are cited by year of publication – starting with the oldest.
- If the title of a cited work is in two or more languages, or if the entire article is in two or more languages, the author must add the titles of the work in the other language (or other languages) in square brackets after the title in the first language. If there are several of these titles, they must be separated by a slash (/) without spaces. If a bilingual or multilingual article in a publication is published in more than one place, the page numbers must be given for each separately, as shown in the example below:
  Horvat, J. (2002): The Hoard of Roman Republican Weapons from Grad near Šmihel [Zaklad rimskega republikanskega orožja z Gradu pri Šmihelu pod Nanosom]. *Arheološki vestnik*, 53, 117–150 [150–192].
- Page numbers are separated by an unspaced dash; authors should be careful to use a dash (–) and not a hyphen (-).
- Every reference must end with a full stop.

39. When citing archive sources it is necessary to give the name of the archive or an abbreviation thereof, the name of the collection and its call number, the number of the unit (folder or box) and the title and number of the cited document, all separated by commas. It is also a good idea to cite, where possible, details that appear on the cited archive material, for example the number and date of publication of a document.

Example of a reference to an archive source

Arhiv Republike Slovenije (ARS), Vicedomski urad za Kranjsko, AS 1, Box 1, Document 942.

40. Internet sources are cited as shown below. The reference should always end with the date of retrieval (the date on which the source was accessed on the web).

Example of a reference to an internet source where the author is known

Avramov, D. (2006): Social exclusion and social security. http://www.avramov.org/documents/document7.pdf (retrieved on 20. 2. 2008).

Example of a reference to an internet source where the author is not known

Internet 1: http://www.international.icomos.org/charters.htm (retrieved on 15. 9. 2008).

Note: in the first case the in-text citation will be: (Avramov, 2006); and in the second case (internet 1, 2...).

41. The list of references should only include works that are actually cited in the text of the article. Each item in these lists is concluded by a full stop.

REVIEW PROCEDURE, PROOFREADING AND COPYRIGHT

42. The editorial office accepts submissions of articles all year round. Authors must submit articles by post to the following address:

Zavod za varstvo kulturne dediščine Slovenije
Varstvo spomenikov – Editorial office
Poljanska cesta 40
SI-1000 Ljubljana

43. Illustrations must be saved in their final form in a folder which is separate from the text of the article.
44. The editorial board reserves the right not to accept for review articles that are not fully drafted in accordance with the instructions for publication in *Varstvo spomenikov*.
45. The editorial board reserves the right not to accept for review articles that are not written in standard literary Slovene.
46. The author will be informed of the results of the peer-review process within a maximum of three months of submission of the article. If the reviewer proposes changes or improvements, the article is returned to the (first-named) author. Corrections and changes may at the same time be proposed by the editorial board. The author shall incorporate the changes proposed by the reviewer and/or editor and return the corrected text within five days. The corrections and changes are checked by an editor. Only those corrections and changes requested by the reviewer and/or editor are permitted.
47. If the review does not require the article to be corrected or supplemented, the review is not sent to the author. In this case the editorial board merely sends the (first) author a notification that the article will be published.
48. The decision on the classification of published articles within the typology of document/works in the COBISS bibliographic system is made by the reviewer. The correctness of the reviewer's decision is checked by the editor. If the editor does not agree with the reviewer's classification, the editor and reviewer decide on the classification together. The decision on the classification of unreviewed articles within the COBISS typology is made by the editor.
49. Before publication all articles written and submitted in Slovene are copy-edited. The copy-edited text is only sent to the author for amendment if the copy editor proposes major corrections or inserts his own comments in relation to substantive content. In such cases the author corrects or improves the text in accordance with the copy editor's comments and returns the corrected text within three days.
50. Translation is done following the peer-review procedure or following incorporation of any corrections proposed by the reviewer and/or editor and a review of any major corrections proposed by the copy editor or comments by the copy editor.

    In order to ensure that the translation is faultless, the translated article is checked before publication by a native speaker of English. If minor corrections are proposed, the translation is not returned to the author but corrections are made by the editorial board on the basis of the proposals of the native speaker. If it is found that the translation is linguistically problematic, the editorial board will arrange professional copy editing. The author will return the copy-edited text of the translation within five days. The amended text of the translation is checked once again. The article is published once it has been confirmed that the translation corresponds to the rules of English usage and the rules contained in these instructions.
51. Foreign authors will make arrangements with the editor for the translation of articles from English to Slovene. The article must be submitted in faultless English. Such articles will also be checked by a native speaker of English.
52. The editorial board may refuse to publish an article at the proposal of an editor or reviewer.
53. Only unpublished articles will be accepted. If the same article is already in the process of publication in another journal, the author must state this explicitly.
54. The author shall retain the moral copyright over original work submitted for publication in *Varstvo spomenikov*, while the material rights of reproduction and distribution in the Republic of Slovenia and other territories shall be transferred to the publisher free of charge, in perpetuity, for all cases, for unlimited editions and for all media.
55. Authors are required to obtain permission to publish illustrations over which they do not hold copyright and to forward said permission to the editorial board.
56. The author himself/herself is responsible for all claims made in an article, which is why we only publish signed articles.
57. On publication, every article author and every reviewer receives one free copy of the publication. Fees are not paid for articles.

Zavod za varstvo
kulturne dediščine Slovenije

REDKA IN DRAGOCENA ZNANJA, SPRETNOSTI IN POKLICI

33. DNEVI EVROPSKE KULTURNE DEDIŠČINE in
11. TEDEN KULTURNE DEDIŠČINE

23. 9.–7. 10. 2023

DOGODKI PO VSEJ SLOVENIJI IN V ZAMEJSTVU

zvkds.si/dekd
dnevievropskekulturnedediscine

ISSN 0350-9494

Zavod za varstvo
kulturne dediščine Slovenije
*Institute for the Protection of
Cultural Heritage of Slovenia*