

## ARHEOLOŠKA ISTRAŽIVANJA PROSTORIJE 3/IX, PRELIMINARNA ZAPAŽANJA

## ARCHAEOLOGICAL RESEARCH INTO ROOM 3/IX PRELIMINARY OBSERVATIONS

**N**astavak istraživanja na objektu IX, donio je interesantne rezultate u okviru prostorije koja je 2009. godine numerisana brojem 3<sup>1</sup>. Iste godine se obistinilo da objekat IX predstavlja hramovski kompleks koji se nalazio u samom središtu grada, sa izlazom na glavnu ulicu - *decumanus* (Baković 2010: 72). Pri tome prostorija 3, pravougaonog oblika, zahvatila je prostor na jugu objekta IX, odmah istočno pored hodnika (prostorija 2), odnosno ulaza u duhovni centar Dokleje (sl. 1,1).

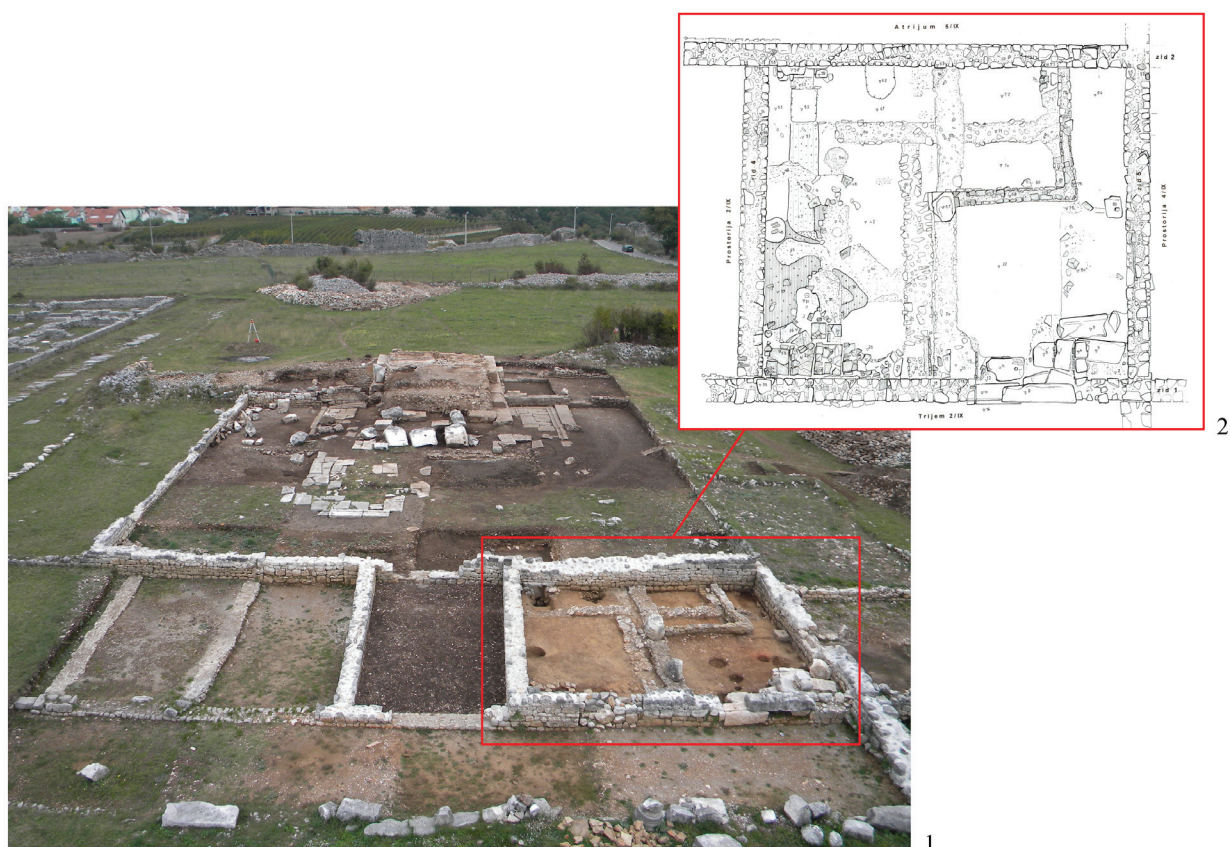
Prva arheološka iskopavanja, koja su najvjerojatnije zahvatila i prostoriju 3, otpočeta su krajem XIX vijeka, 1893. godine. Tada je R. Munro, sa engleskom ekipom arheologa, sproveo manja istraživanja na južnom dijelu objekta IX, koji je označio sa E (*portico*) (Munro *et al.* 1894: 8). Tom prilikom trem i prostorija 4 (istočno pored prostorije 3) su najviše istražene, dok za prostoriju 3 nije jasno u kojoj je mjeri arheološki tretirana. Na planu, ona je ucrtana sa prostorijom 2 kao jedna odaja. Cijeli objekat im se, međutim, pokazao manje vrijednim dovršetka iskopavanja, zbog kako navode znatno loše očuvanosti, te je engleska ekipa odustala od istraživanja. P. Sticotti, koji i imenuje objekat, početkom XX vijeka također pominje da je objekat sa južne strane otkopan, ali bez bližih podataka i opisa (Sticotti 1999: 147). Nakon višegodišnjeg prekida interesovanja za objekat IX se ponovo javilo u XXI vijeku, kada su 2005. i 2009. nastavljeni radovi u ovom dijelu. Stanje u okviru prostorije 3, koje su zatekli

**T**he carry out of research into Building IX gave interesting results *apropos* the room which was in 2009 numbered 3<sup>1</sup>. That same year, it came to light that Building IX stood for a temple complex, which had been situated in the very centre of the town, with a portal facing the main street - the *decumanus* (Baković 2010: 72). It may be added that Room № 3, rectangularly shaped, extended over the southern area of Building IX, right on the east by the hall (Room № 2), that is by the entrance to the spiritual centre of Doclea (Fig. 1,1).

The first archaeological excavations, which most probably included Room № 3 as well, began at the end of the 19<sup>th</sup> century, more precisely in 1893. On that occasion, R. Munro, with a team of British archaeologists, carried out smaller pieces of research into the southern part of Building IX, which was marked by him with the letter E (*portico*) (Munro *et al.* 1894: 8). On the same occasion, the doorway and Room № 4 (on the east, by Room № 3) were the most explored ones, while it is not clear to what extent Room № 3 was archaeologically treated. Rooms 2 and 3 were drawn on the map as one single, undivided area. However, it was judged by the British team that it was not worth completing excavations on the whole building, due to the apparently extremely poor conditions it was found in, and further research was abandoned, accordingly. P. Sticotti, who named the building, also mentioned at the beginning of the 20<sup>th</sup> century that the building had been dug into on the southern side, without

1 Iskopavanja tokom septembra i oktobra 2010. god. su realizovana od strane JU Muzeji i galerije Podgorice. Radovima je rukovodio M. Baković, dok je nosilac projekta D. Radović. U iskopavanjima su, pored rukovodioca istraživanja, kao članovi terenske ekipe učestvovali: dipl. arheolozi D. Drašković i M. Živanović, arhitektonski tehničar T. Mijović i studenti arheologije N. Borovinić i N. Radunović. Na ovom mjestu bih iskoristio priliku da se zahvalim kolegici M. Reškovoju na ustupljenim rezultatima numizmatičke obrade, koji su bili veoma korisni pri hronološkom omeđivanju pojedinih perioda u ovom radu. Ništa manju zahvalnost dugujem i kolegi A. Antonarasu na savjetima i diskusiji na polju kasnoantičkog staklarstva.

1 Excavations, carried out in September and October 2010, were conducted by the Public Institution "Museums and Galleries" of Podgorica. The activities were administered by M. Baković, while the project manager was D. Radović. Besides the administrator of the research activities, the members of the field crew who also took part in the diggings were: Graduate Archaeologist D. Drašković and Graduate Archaeologist M. Živanović, Architectural Technician T. Mijović and students of archeology - N. Borovinić and N. Radunović. At this point, I would take the opportunity to thank my colleague M. Reškova on disclosing to us the results of the numismatic processing, which were extremely useful for making chronological distinctions between certain periods in this piece of work. I owe no less gratitude to my colleague A. Antonaras, both for the received tips and the illuminating discussion on the matter of late-Antique glass manufacturing.



Slika 1, 1 - Hram sa atrijumom i prostorijama oko njega, posmatrano sa J (foto M. Živanović), 2 - Prostorija 3/IX zatečeno stanje nakon iskopavanja 2009. god. (crtež T. Mijović)  
 Figure 1, 1 - Temple with atrium and rooms around, taken from south (photo M. Zivanovic), 2 - Room 3/IX, case found after 2009 excavation (drawing T. Mijovic)

rukovodioci ovih iskopavanja, jasno svjedoči da je na tom mjestu bilo nekog prekopavanja. Tako se u terenskim dnevnicima pominje “kupasto nabacena zemlja”, “zatrpan rov” (možda od vojske) i sl. (Dnevnik iskopavanja 2005: list br. 21 i 22; Dnevnik iskopavanja 2009: list br. 5).

Iskopavanja sprovedena 2005. godine zahvatila su najveći dio prostorije 3. Pošto se radilo po kvadratnoj mreži, po sistemu kopanja naspramnih kvadrata (šah polja), sonda tj. kvadrat 17, prošao je kroz sredinu prostorije, dok su njeni uglovi „načeti“ kvadratima 11, 13, 21 i 23. Nastavak istraživanja 2009. godine prostoriju 3 je posmatrao kao cjelinu i prema tome su uklanjani ostaci kvadrata uz zidove prostorije. Zbog nepogodnosti vremenskih uslova, uočena složenost arheoloških nivoa i slojeva nije se mogla do kraja istražiti (Baković 2010: 69-70).

Tako se u kampanji 2010. godine radilo na nekoliko nedokopanih slojeva, i to: u istočnom dijelu prostorije - sloj žuto-mrke zemlje, naročito

providing any further facts or descriptions (Sticotti 1999: 147). After a break of several years interest in Building IX was stirred up again in the 21<sup>st</sup> century, when, in 2005 and 2009, work in this area was restarted. The conditions that Room № 3 was found in by those who conducted these excavations clearly confirmed the existence of some sort of previous digging in that particular site. In the site-reports, there is mention of “conically dumped earth”, of a “buried trench” (maybe made by the army), and the like (Dnevnik iskopavanja 2005: list br. 21 i 22; Dnevnik iskopavanja 2009: list br. 5).

The excavations conducted in 2005 covered most of Room № 3. Since the digging was performed by adopting a system of alternating squares (checkerboard), the sounding – quadrant 17 – went through the middle of the room, whereas its corners were merely cut into by quadrants 11, 13, 21 and 23. During subsequent research in 2009, Room № 3 was regarded as an integral unit and therefore the remains of the squares near the walls of the room were accord-

masivan uz istočan zid, sloj tamno-mrke zemlje u sjeveroistočnom uglu; i u zapadnom dijelu - nekoliko malternih površina i situacija s opekama u jugozapadnom uglu (sl. 1,2). Takođe, konstatovana je vertikalna stratigrafija, a otkrivene su i nove zatvorene cjeline od kojih su neke dobro datovane. Uprkos činjenici da se radilo na ostacima od prethodnih iskopavanja i da je dobar dio prostorije doveden do zdravice, arheološke situacije su se uspjele razdvojiti u nekoliko perioda i faza, pa ih ovom prilikom iznosimo.

### Period 1

Najstariji period, čiji su ostaci najslabije sačuvani, posvjedočen je sa svega dva zida (zidovi 110 i 210) i na par mjesta fragmentovano očuvanim slojem crvene zemlje sa kamenim opiljcima (sl. 2). U ovom periodu nije postojao arhitektonski sklop prostorije 3, a na osnovu dosadašnjih istraživanja nije moguće diskutovati o izgledu i veličini građevine koja se na ovom prostoru prvobitno nalazila. Zidovi koji se pripisuju ovoj fazi su sačuvani samo u temeljnoj zoni, svega 0,10 m najveće visine i širine od oko 0,47/0,50 m. Zidani su od lomljenog kamena i maltera kojeg karakteriše puno sitnog pijeska u sastavu. Ukopani su u crvenu nabijenu zemlju, koja ovdje predstavlja zdravicu. Ovi zidovi su u kasnijim izgradnjama više puta negirani i presječeni (presjekli su ih zidovi 4, 5, 310, 410). Jedan od njih, zid 110, prolazi čitavom dužinom prostorije 3 i ide paralelno na oko metar od kasnije sagrađenog sjevernog zida prostorije 3 (zid 2). Zid se nadalje prostire i kroz hodnik (prostorija 2) čime ga je presjekao zapadni zid prostorije (zid 4). Prema istoku zid je narušen ukopom 1/10 iz perioda 3 faza 1, ali obluci koji se podvlače ispod zida 5 govore o prostiranju temelja najstarijeg zida i u tom pravcu. U istom pravcu u prostoriji 4 se pruža zid koji se u svom gornjem dijelu naslanja na istočni zid prostorije 3, pa tu situaciju treba objasniti gornjom pregradnjom iz perioda 2, koja je nalegla na stariji zid perioda 1. Na zid 110 pod pravim uglom naliježe zid 210. Zid je sazidan identičnim materijalom i tehnikom zidanja, i prostire se dužinom od 5,25 m do južnog zida P3 (zid 1). Nije uočeno da li nastavlja dalje južno, u tremu.

ingly removed. Because of deterioration in weather conditions, it was not possible to complete the investigation into the observed complexity of archaeological levels and layers (Baković, 2010, 69-70).

So in the course of the campaign conducted in 2010 excavation of those few layers where the digging had come to a halt proceeded: in the east part of the room – the layer of light-brown earth, particularly voluminous by the east wall, and the layer of dark-brown earth in the north-east corner and in the west part – a few mortar surfaces and set-ups with bricks in the south-west corner (Fig. 1.2). Furthermore, a vertical stratigraphy was ascertained and several new intact units were discovered, some of them rather well preserved. In spite of the fact that the research was carried out on the remains of previous excavations and that a good deal of the room was brought to the level of subsoil, archaeological settings started to be separated out into several periods and stages, which will be presented here.

### Period 1

The oldest period, the remains of which are, at the same time, the worst preserved, is recorded in only two walls (Wall № 110 and Wall № 210) and by a conserved fragmented layer of red earth with stone chips, present at a few other sites (Fig. 2). At the time, the architectural structure of Room № 3 did not exist and on the basis of research undertaken so far it is not possible for us to discuss the appearance and size of the construction which was originally situated on this spot. The walls which were attributed to this period were preserved merely in the foundation zone, measuring 0.10 m in total, reaching a maximum height and width of about 0.47 m and 0.50 m respectively. They were built out of broken stones and mortar, which is distinctive for having plenty of fine sand in its composition. They were dug into the packed red earth, which here means the subsoil. In the later stages of construction these walls were interrupted and intersected several times (Walls № 4, № 5, № 310, and № 410 cut across them). One of them, Wall № 110, extended the entire length of Room № 3 and ran parallel at a distance of about one metre from the subsequently erected north wall in Room № 3 (Wall № 2). The wall ran further along the hall as well (Room № 2), where the west wall of the room crossed it (Wall



- Period 1
- Period 3, Faza 1
- Period 3, Faza 2
- opeka
- krečni malter
- zdravica
- lomljeni kamen - kameni opiljci
- šjunak
- siva zemlja - jako zapečena
- zapečena žuta zemlja
- crvena nagorela zemlja



Slika 2 - Prostorija 3/IX - osnova perioda 1 i 3 faze 1 i 2 (crtež T. Mijović)  
 Figure 2 - Room 3/IX - Plan of period 1 and 3 and phase 1 and 2 (drawing T. Mijović)

crtao: *T. Mijović*

A t r i j u m  
5 / IX

T r i j e m 2 / IX

Rp	Apsolutna vrijednost	Apsolutna vrijednost	Apsolutna vrijednost
1	222	353	153
2	330	334	154
3	348	339	155
4	335	339	156
5	305	331	157
6	320	338	158
7	312	331	159
8	331	327	160
9	340	327	161
10	340	315	162
11	335	315	163
12	335	315	164
13	298	318	165
14	324	318	166
15	320	327	167
16	328	336	168
17	344	345	169
18	330	345	170
19	491	342	171
20	491	342	172
21	491	342	173
22	341	331	174
23	333	337	175
24	270	340	176
25	340	340	177
26	340	340	178
27	354	318	179

Ovom periodu posredno smo pripisali i sloj crvene zemlje, pomiješane sa oštrim kamenim opiljcima. Ovaj sloj, odnosno njegovi ostaci, sačuvani su samo na nekoliko manjih površina kao proslojci (sl. 2). Proslojci leže na zdravici sa najvećom debljinom od oko 0,10 m i u zapadnom dijelu prostorije 3 javljaju se sa manjom količinom kamenih opiljaka. Od materijala u ovom sloju pronađeno je nekoliko ulomaka keramike i više komada krupnih životinjskih kostiju. Keramički materijal je karakterističan i pripada periodu druge polovine I/početak II v. Najzastupljeniji su ulomci manjih posuda i to italske tere sigilate (Drag. 17b), zapušać za amfore i ulomci koji pripadaju istočno-mediteranskoj sigilati B II, a od keramike grublje fakture pronađena su samo dva ulomka jednog lonca. Iako nije arheološki pronađena direktna veza zidova i slojeva, smatramo da pripadaju istom periodu, odnosno vremenu druge polovine I i početka II v., kada Dokleja započinje svoj život. Još jedan razlog za opredjeljivanje zidova u isto vrijeme kada i materijal iz sloja crvene zemlje sa opiljcima, jesu zidovi pronađeni ispod ploča atrijuma hrama (prostorija 5). Iznad tih zidova, a ispod ploča atrijuma, pronađen je novac s kraja I v. (Baković 2010: 74), koji razgraničava periode 1 i 2.

## Period 2

Tokom II/III vijeka, izgrađen je cijeli objekat IX, pa i prostorija 3. Prostorija tada dobija konačan pravougaoni oblik dimenzija 7,90 m (zid 2) - 8 m (zid 1) x 6,90 m (zidovi 4 i 5) i ulaz preko trema direktno sa glavne ulice (sl. 3). Zidovi debljine od 0,50 do 0,58 m zidani su od pritesanih manjih i većih kvadera, vezanih malterom. Na pojedinim mjestima sačuvani su i do visine od 1 m. Temelji zidova su ukopani u zdravicu i oblikovani tako što je lomljeni kamen utopljen u krečni malter u precizan temeljni rov. Jedini sigurni ulazi u ovu prostoriju potvrđeni su na južnom zidu, i to dva, od kojih je zapadni širine 1,65 m, dok je istočni ulaz mlađim prezidivanjima deformisan, te se njegova širina nije mogla tačno izmjeriti. Po spojevima razlučeno je da je istočni zid (zid 5) prostorije 3 prvi zidan, potom sjeverni i južni (zidovi 2 i 1), i na kraju zapadni (zid 4).

№ 4). On the eastern side, the wall was damaged by Shaft 1/10 from Period 3, Stage 1, but the pebbles noticeable under the wall № 5 spoke of the expanding of the foundations of the oldest wall in that direction. In that same direction, a wall ran in Room № 4, leaning towards the top against the east wall of Room № 3, so that the situation should be interpreted as the upper superstructure from Period 2 leaning against the older wall belonging to Period 1. Wall № 110 was at right angles to Wall № 210. The latter was built from identical material and using the same building technique as the other and extended for a length of 5.25 m as far as the south wall from Period 3 (Wall № 1). It was not observed whether it continued to the north or south inside the porch.

We implicitly attributed the layer of red soil mixed with sharp stone chippings to this period. This layer, that is - its remains, was preserved only on several smaller surfaces as dirt bands (Fig. 2). Dirt bands covered the subsoil, reaching a maximum thickness of approximately 0.10 m, appearing with a smaller quantity of stone chips in the western area of Room № 3. Among the materials that were found in this layer, there were a few fragments of pottery and several pieces of large animal bones. The ceramic material was distinctive and it dated to the second half of the 1<sup>st</sup>/the beginning of the 2<sup>nd</sup> century. The most commonly found fragments were the chips of smaller dishes, more exactly the Italic *terra sigillata* (Drag. 17b), stoppers for amphorae and chips belonging to the East Mediterranean *sigillati B II* and, as for ceramics of rougher composition, only two chips of a pot were found. Though no direct archaeological link which would connect the walls to the layers was found, we believe that they both belong to the same period, that is to the second half of the 1<sup>st</sup> and the beginning of the 2<sup>nd</sup> century, when Doclea started up a life of its own. What supported the argument in favour of ascribing the walls to the same period as the material in the layer of red soil with the chippings was the discovery of walls under the slabs of the entrance hall, inside the sanctuary (Room № 5, Period 2). Above these walls and beneath the entrance hall slabs, coins from the end of the 1<sup>st</sup> century were recovered (Baković, 2010: 74) and these enabled the researchers to distinguish between Periods 1 and 2.

16.09	2010	Apsol. viš. / m	18.09.	2010	Apsol. viš. / m
Rp	141	4711	Rp	129	4708
1	151	4711	1	130	4708
2	228	4711	2	134	4705
3	217	4723	3	135	4705
4	227	4713	4	136	4681
5	245	4695	5	137	4681
6	244	4695	6	138	4703
7	239	4701	7	139	4714
8	240	4710	8	140	4721
9	240	4700	9	141	4715
10	243	4707	10	142	4716
11	236	4704	11	143	4693
12	236	4704			
13	245	4695	21.09.	2010	
14	238	4702	Rp	234	4699
15	244	4695	144	344	4700
16	251	4689	145	343	4700
17	247	4683	146	311	4732
18	246	4694	147	323	4720
19	247	4693	148	343	4700
20	240	4690	149	345	4698
21	250	4690	150	345	4695
22	255	4685	151	324	4701
23	243	4697	152	346	4695
24	245	4695	153	351	4692
25	240	4700	154	333	4710
26	240	4700	155	345	4698
27	246	4684	156	340	4703
28	266	4674	157	346	4695
29	248	4692	158	341	4702
30	245	4695	159	322	4721
31	272	4685			
32	228	4712			

- Period 2
- Period 3, Faza 1
- Period 2 - 4?
- opeka
- krečni malter
- zdravica
- crna zemlja
- mrka zemlja
- žuto-mrka zemlja
- malterna površina
- lomljeni kamen - kameni opijlji
- šljunak
- gar



crtača: *Štefan Ajdich*



Slika 2 - Prostorija 3/IX - osnova perioda 1 i 3 faze 1 i 2 (crtež T. Mijović)  
 Figure 2 - Room 3/IX - Plan of period 1 and 3 and phase 1 and 2 (drawing T. Mijović)

Kanal, u sjeverozapadnom uglu prostorije, građen je kad i sjeverni zid (zid 2). On se prostire iz atrijuma (prostorija 5) i naniže nastavlja, kroz pravougaoni otvor u sjevernom zidu, u prostoriju 3. Pravougaoni otvor je sa gornje strane bio popločan, o čemu svjedoče polomljene kamene ploče koje štrče iz južnog lica zida 2. Dno kanala je takođe popločano. Ono je u atrijumu u potpunosti sačuvano, dok je u prostoriji 3 uništeno, te je na tom mjestu ostala veća jama. Južno od jame se nalazi pravougaoni ukop dimenzija 0,84 x 0,58 m, ukopan oko 0,22 m u zdravicu. Jamu od ukopa odvaja mala pregrada, koja se sastoji od grumenja maltera i lomljenog kamena i opeke, možda za gornje popločanje kanala. Vidno je da je u pravcu kanala zid 110 iz perioda 1 presječen i sačuvan na nižem nivou, a pri tom nije uočena pjeskovita zemlja koja na planu 2009. u istom pravcu ukopa produžava južno (sl. 1,2). Popločani otvor, velika jama, i pravougaoni ukop govore da se na tom mjestu nalazila određena konstrukcija koju je sada nemoguće definisati, te funkcija kanala ostaje neobjašnjena. Domišljanja da li je možda imao neke veze sa kulturnim obredima u atrijumu (libacija?) mogu se potvrditi jedino iskopavanjima u atrijumu. U cijelom kanalu nije bilo mnogo arheološkog materijala. Od metalnih nalaza izdvaja se bronzana alka i fragmentovani dio kompaktnog bronzanog lanca, rađen tehnikom spajanja omče u omču. Od keramičkog materijala izdvajaju se ulomci žižka i pehara tankih zidova, koji se datuju u II i početak III v.

U sjeverozapadnom dijelu zapadne polovine prostorije 3 sačuvana je malterna površina nepravilnog oblika, koja pripada istom periodu (sl. 3). Ona je prislonjena na zapadni zid i dijelom prekriva zid 110. Malterne površine (malternici) istog sastava, potvrđene na još dva mjesta, mogući su nivoi sa kojih je započeto građenje lica zidova. Sastojali su se od kreča i sitnog pijeska i ležali su na sterilnom sloju - zdravici, a u jednom dijelu na sloju crvene zemlje sa opiljcima (period 1).

Od prethodnih iskopavanja na većem dijelu zapadne polovine prostorije 3 ostao je sačuvan malter i sloj crne zemlje, označen na slici 3 žutom bojom. Malter, ukupne debljine od 0,04 do 0,10 m, razlikovao se od prethodno opisanih malternih površina, jer je pored kreča i pijeska sadržao i sit-

## Period 2

In all probability, the entire Building IX was built in the 2<sup>nd</sup>/3<sup>rd</sup> century, including Room № 3 as well. It was back then that the room assumed its final rectangular shape, measuring 7.90 m (Wall № 2) - 8 m (Wall № 1) × 6.90 m (Wall № 4 and Wall № 5), as well as an entrance via a doorway directly from the main street (Fig. 3). The walls, 0.50 m – 0.58 m thick, were built out of small and large rectangular blocks, roughly put together and joined with mortar. On certain spots, the remains of walls up to 1 m high have been preserved. The foundations of the walls were dug into the subsoil and shaped by means of amalgamating broken stones with lime mortar into a precisely measured core trench. The only definite entrances into this room were confirmed in the south wall, and there are two of them - the west entrance, which was 1.65 m wide, and the east entrance, which has been deformed by means of somewhat recent partitioning and, consequently, is not precisely measurable in terms of width. By means of analysing the junctures, it was concluded that the east wall (Wall № 5) in Room № 3 was built first, followed by the northern and south ones (Wall № 2 and № 1), and ultimately the west wall (Wall № 4).

The channel, which was situated in the north-west corner of the Room, was built at the same time as the north wall (Wall № 2). It ran from the entrance hall (Room № 5) downwards, through a rectangular opening in the north wall into Room №3. The rectangular aperture's top section was panelled, as evidenced by the broken stone slabs sticking out of the southern aspect of Wall № 2. The bottom section of the channel was also tiled. The panelling in the entrance hall was entirely preserved, while it was completely ruined in Room № 3, leaving a rather large pit behind. Southwards from the pit there was a rectangular shaft, the dimensions of which were 0.84 m × 0.58 m, dug approximately 0,22 m into the subsoil. The pit was separated from the shaft by a small partition, which was composed of lumps of mortar and discarded stone and brick, maybe intended for the upper panelling of the conduit. It was evident that Wall № 110 from Period 1 was cut off in the direction of the channel and preserved on a lower level, and none of the sandy earth indicated on the map in 2009 was observed extending southwards in the same direction of the shaft (Fig. 1.2). The tiled aper-

no kamenje. Opeke koje su ležale na njemu nisu bile solidnije vezane, a u južnom dijelu navedene situacije malter je imao više kreča. Ispod maltera u sjevernom dijelu pojavila se zemlja crvene i mrke boje, a u južnom i zapadnom dijelu sloj crne zemlje, do 0,10 m debljine do zdravice. Sloj crne zemlje, koji je najmasivniji, sastojao se od gari pomiješane sa sitno izdrobljenom opekam. U svim ovim slojevima nije pronađen hronološki osjetljiv materijal, tako da nismo uspjeli da zamršenu situaciju opredijelimo kojem periodu pripada. Vjerovatno je mlađa od perioda 1, što se na planu i ne vidi, jer je u prošlim istraživanjima iskopan prvo zid 210. Samo okvirno situacija se smješta u periode od 2 do 4.

Nameće se pitanje zašto nema više potvrda života u periodu 2. Ni jedna zatvorena cjelina se ne može povezati s ovim vremenom (II i III v.) a materijal koji se hronološki opredjeljuje u II i III v. je neznatan. Jednim dijelom nedostatak materijala i cjelina iz ovoga perioda treba tražiti u iskopavnjima 2005, kada nije posvećena pažnja vertikalnoj stratigrafiji, dok većim dijelom razloge nalazimo u kontinuiranom korišćenju prostorije u mlađim periodima.

### Period 3

Period 3 u prostoriji odgovara fazama koje su samo relativno mogle da se odrede. Tokom faze 1 perioda 3 posvjedočen je život radionice za preradu metala. U toj fazi treba predložiti ulaz samo sa zapadne strane južnog zida (zid 1) (sl. 2). Iako nisu dovršena iskopavanja u dijelu gdje se nalazio ulaz sa istočne strane južnog zida, smatramo da on nije mogao da funkcioniše u ovoj fazi. Razlog za ovu tvrdnju je koncentracija sloja crne zemlje sa gari, ali i elemenata za koje pretpostavljamo da direktno govore o metalurškim procesima u tom dijelu.

U istočnoj polovini prostorije 3, ispod fragmentovano očuvanog sloja žutomrke zemlje iz perioda 4, otkriven je sloj crne zemlje sa gari koji karakteriše fazu 1 perioda 3 (sl. 3). Sloj je tamno crne boje, jer se sastoji većinom od gari, mada sadrži i ulomke opeke i sitnog kamenja. Arheološki materijal u njemu je osoben i čini ga većim dijelom metalurški otpad: različite vrste zgure,

the large pit and the rectangular shaft speak of the existence of a certain construction on the same spot, which is impossible to determine at this time, and therefore the function of the channel remains unexplained. Speculations about it having something to do with ritual ceremonies in the entrance hall (*libation?*) may be ascertained only through excavations in the area of the entrance hall. The entire channel was not rich in archaeological material. Amongst the metallic finds, a bronze ring and a fragment of a compact bronze chain produced by use of the technique of interlocking loops stand out. As for ceramic material, chips of oil lamps and thin-walled goblets might be singled out, dating from the 2<sup>nd</sup> century and the beginning of the 3<sup>rd</sup> century.

In the north-west area of the west half of Room № 3, there was a preserved surface in mortar of irregular shape belonging to the same period (Fig. 3). It sloped towards the west wall (Wall № 4) and partly covered Wall № 110. The surfaces made of mortar of the same constitution, also observed on two other sites, are considered to have possibly been base levels for the construction of the surfaces of the walls. They were composed of lime and fine sand and laid on a sterile layer – the subsoil and in one other part on a layer of red soil with chippings (Period 1).

From the previous excavations, carried out in most of the western area of Room № 3, some mortar was preserved, and a layer of dark earth marked on picture № 3 with yellow. The mortar, 0.04 m to 0.10 m thick in total, is distinct from the previously described surfaces in the mortar as it contains, besides lime and sand, some small stones as well. The bricks lying on it were not connected that tightly and in the southern area of the aforementioned setting the mortar contained a higher proportion of lime. Red and brownish soil appeared underneath the mortar in the northern section and, in the southern and western areas, a layer of dark earth, up to 0.10 m thick, turned up near the subsoil. The layer of dark earth, which was the most massive one, was composed of soot mixed with finely ground bricks. Amongst all these layers, no chronologically sensitive material was discovered, so we were not able to determine to which period this complex setting belonged to. It is probably more recent than Period 1, which cannot be ascertained from the map though, because during the previously conducted research Wall № 210 was



gvozdeni polomljeni predmeti pločastog oblika i klinovi, bronzani opiljci, tehnička keramika, od koje se izdvajaju ulomci posuda za livenje metala. U manjoj količini sloj posjeduje keramički materijal i usitnjene nagorele životinjske kosti, zelenkaste boje. Nakon skidanja nekoliko centimetara ovog sloja ukazali su se obrisi jama (jame od 2 do 5/10) ispunjene takođe pomenutim slojem crne zemlje sa gari. Istom nivou pripada situacija pri središnjem dijelu južnog zida prostorije 3, koja je narušena ukopavanjem konstrukcije od opeka iz perioda 4. Situacija se sastoji od prolivene bronzne koja je ostala sačuvana pored sjeveroistočne ivice konstrukcije od opeka i jako zapečene zemlje ovalnog oblika, dimenzija 0,30 x 0,20 m, koja je otkrivena ispod pomenute konstrukcije. Zapečena zemlja je u gornjem dijelu imala ovalnu zelenkastu mrlju, a potom ispod nje sloj žute, pa sloj crvene zapečene zemlje. Nije isključeno da ona predstavlja ostatak od kovačke peći. Istoj fazi perioda 3, zbog materijala i istovjetnog nivoa priključili smo ostale jame i ukope. Sve cjeline su ukopane u zdravicu i nadalje ih redom opisujemo (sl. 2).

Jama 1/10 kružnog oblika, dimenzija od 0,62 do 0,65 m u prečniku i sa najvećom dubinom od 0,30 m, nalazi se uz zapadni zid (zid 4) prostorije 3. Za razliku od drugih jama, u gornjem nivou imala je veću kamenu ploču i još nekoliko manjih kameana, koji su je na neki način zatvorili. Zapuna jame je rastresita zemlja mrke boje sa većim komadima opeka. Od arheološkog materijala u jami je pronađena veća količina sitnih životinjskih kostiju, malo stakla i par metalnih nalaza (klin i klamfa?). Od keramičkog materijala izdvajaju se pet ulomaka iste zdjele „S“ profilacije, kojoj je pridodat još jedan ulomak pronađen 2009. godine u „trećem otkopnom sloju“. Novcem je datovana u drugu polovinu IV vijeka. Povezanost ove jame sa koncentracijom jama na istočnoj polovini prostorije uslijedila je tek naknadno, pri obradi keramike. Tada je uočeno da se ulomak trbuha amfore (ili krčaga?) (ib. 77/10) spaja sa ulomkom iz jame 2 (sm. 85/10) i još jednim iz sloja crne zemlje sa gari iznad pomenute jame (sm. 72/10).

Jama 2/10 nepravilno kružnog oblika, ima dimenzije po osi sjever-jug 0,91 m, a po osi istok-zapad 1,10 m i dubinu od 0,45 m. Nalazi se u jugoistoč-

examined first. This setting may only be generally dated during Periods 2 to 4.

The question arises as to why there is not more evidence of life in Period 2. No closed unit may be associated with this time (the 2<sup>nd</sup> and 3<sup>rd</sup> centuries) and material chronologically sorted out for the 2<sup>nd</sup> and 3<sup>rd</sup> centuries is extremely scarce. Partly, the lack of material and integral data on this period can be explained by the excavations carried out in 2005, which paid no attention to the vertical stratigraphy, but the reasons lie mostly in the continuous utilization of the Room in more recent stages.

### Period 3

Period 3 within the room corresponds to the stages that we are only able to determine in relative terms. The operation of a workshop for metal processing during Stage 1 of Period 3 was evidenced. During that stage, only the hypothesis of an entrance from the west side of the south wall (Wall № 1) should be taken into consideration (Fig. 2). Although the excavations in the area in which there was access from the east side of the south wall were not completed, we believe that it could not have served any function at this particular stage. The reason for this claim is the rather high concentration of soot in the layer of dark earth and also of elements which we assume to directly point to metallurgical processes taking place in this section.

In the eastern half of Room № 3, under the fragmented layer of yellow-brown soil preserved from Period 4, a layer of dark earth with soot was discovered, which was characteristic for Stage 1 of Period 3 (Fig. 3). The layer was dark, almost black and mainly consisted of soot, though it also contained brick chippings and small stones. The archaeological material in it was quite unique and mostly composed of metallurgical waste: different types of slag, broken iron plate-shaped items and pins, brass slats, technical ceramics, from which fragments of containers for metal casting might be singled out. The layer contained a small quantity of ceramic material and greenish fragmented burnt animal bones. After removing a few inches of this layer, the contours of pits were evident (pits from 2 to 5/10), which were also filled with the same layer of dark earth with soot. The set-up at the middle of the south wall in Room



Slika 4 - Korinška reljefna posuda iz jame 2/10 (foto D. Miljanić)  
Figure 4 - Corinthian relief bowl from pit 2/10 (photo D. Miljanic)

nom dijelu prostorije, sjeverno od istočnog ulaza na južnom zidu i od sekundarno postavljenog kamenog bloka iz faze 1 perioda 5, ispod kojeg se malo i podvlači. Ima složeniju zapunu koja se u gornjem dijelu, visine 0,17 m, sastoji od već pomenutog sloja crne zemlje sa gari. U donjem dijelu, visine 0,28 m, zapuna je tamnomrke boje zbog manje količine gari. U tom sloju zapune ima više krupnijih kostiju, opeka, kamena i manjih grumenja maltera. Materijal, naročito grnčarija i metalni otpad, govori da su ova dva sloja zapune istog karaktera. Zapuna je veoma bogata arheološkim materijalom. Od keramičkih nalaza ulomci korinškog pehara (sl. 4) i ulomak posude istočno-mediteranske sigilate B II datuju jamu u široki vremenski raspon od II do IV v. Pronađen je i obod lonca spolja narandžaste, a iznutra sive boje, koji se naknadno iskoristio u livačke svrhe, te se na vratu sa unutrašnje strane sačuvala slijepljena zgura (ib. 96). Stakleni nalazi su malobrojni, a fragmenat drške nalikuje drškama staklenih krčaga IV v. Metalurški otpad je zastupljen, kako velikim brojem većih i manjih grumena zgure, gvozdениh klinova, tako i manjim bronzanim i gvozdениm predmetima (polomljeni djelovi oplata od gvožđa, gvozdени i usitnjen bronzani lim, bronzana žica i sl). Samo jedan metalni predmet je moguće od olova. Ulomci tehničke keramike su takođe brojni. Od njih su se jedino mogle odrediti posude za livenje metala, dok se za ostale ulomke ne zna čemu su služili (djelovi peći, ili zgura sa otkom od posuda za livenje). Svi ulomci su deformisani jakim temperaturama, sa puno mjehurića od gasa u sebi i lagane su težine. Sličnost uočena sa materijalom iz antičkog grada u Ksantenu (*Co-*

№ 3, which was damaged in the process of digging in the construction of bricks in Period 4 also belonged to the same level. The set-up consisted of poured-out bronze, which had been preserved near the north-east edge of the construction with bricks, and badly burnt soil, oval in shape, measuring 0.30 m × 0.20 m, which was discovered under the previously mentioned construction. The burnt soil showed an oval greenish stain in its upper fraction and, right beneath it, a yellow layer and then a layer of red burnt soil. It is not to be discounted that it was a relic of a blacksmith's furnace. We made a link between the other pits and shafts and that same stage of Period 3 because of the material and the identical level. All units were dug up into the subsoil and will be further described in turn (Fig. 2).

Pit 1/10, round in shape, measuring 0.62 m to 0.65 m in diameter, with a maximum depth of 0.30 m, was located by the west wall (Wall № 4) in Room № 3. Unlike the other pits, a larger stone slab and a few smaller stones closed it up somehow from above. The fill was made of loose brown earth with large brick slates. As for the archaeological material, a fairly large quantity of small animals' bones, a little bit of glass and a couple of metal finds (a wedge and a cramp?) were found inside it. Of the ceramic material, five fragments belonging to the same bowl (with an "S" profile) might be singled out, adjoined by one other fragment found in 2009 in the "third dug-up layer". The analysis of the recovered coins made it possible for us to date it to the second half of the 4<sup>th</sup> century. The correlation between this pit and all the pits in the eastern half of the room came only later when processing ceramics. It was then noticed that a fragment of the body of an amphora (or a pitcher?) (Ib. 77/10) was connected to a chip from Pit № 2 (sm 85/10) and one other from the layer of dark earth with soot above the aforementioned pit (sm. 72/10).

Pit 2/10, of an irregular circular shape, measured 0.91 m along the north – south axis and 1.10 m on the east – west axis, and it was 0.45 m deep. It was situated in south-east part of the room, north of the east entrance on the south wall and in relation to the later placed stone block belonging to Stage 1 of Period 5, which it slightly underlies. Its fill was more complex, consisting in the upper part at a height of 0.17 m of the aforementioned dark earth layer with soot. In the lower section, at a height of 0.28 m the

*lonia Ulpia Traiana*) potvrđuje da većinom pripadaju ulomcima zgure koje su ispunjavale posude za livenje (Rehren, Kraus 1999: 266, fig 3).

Jama 3/10, kružnog oblika, dimenzija u prečniku od 0,38 do 0,41 m i oko 0,20 m dubine, nalazi se sjeverno od jame 2/10. Zapuna je istog sastava kao i sloj iznad, tj. sloj crne zemlje sa gari. Odmah pri površini zapune pronađeni su veliki komadi zgure, nekoliko ulomaka tehničke keramike, a pri zapadnom zidu jame nađena je najkompletnije sačuvana posuda za livenje.

Jama 4/10, takođe kružne forme, ima prečnik oko 0,52/0,54 m, dubinu od 0,35 m, i zapunu crnu zemlju sa gari, u kojoj je od arheološkog materijala pronađena samo usitnjena zgura i dvije pločice od gvožđa.

Jama 5/10, istovjetne zapune kao prethodna, ima dimenzije: u prečniku oko 0,16/0,18 m i dubinu od 0,20 m. Nalazi se između jama 2/10 i 3/10, a sadržala je grumenje zgure i metala i jednu nagorjelu životinjsku kost.

Jama 6/10, nepravilnog oblika i dimenzija 0,13 x 0,20 m, je svega 0,05 m ukopana u zdravicu. U zapuni (crna zemlja sa gari) ove plitke jame nije bilo arheoloških nalaza.

Jama 7/10 ima nepravilan elipsoidni oblik čije dimenzije po osi sjever-jug iznose 0,80 m, a po najdužoj osi istok-zapad 0,53 m. Jama je otkrivena nakon uklanjanja ložišta peći iz perioda 4, sjeverno od jame 6/10, a njena dubina varira između 0,18 i 0,25 m. Zanimljivo je da se zapuna ove jame sastoji samo od pepela. Pepeo je svijetlo sive boje i sadrži male komade - mrvice gareži, sporadično opiljke od bronz e i svega nekoliko grumenja zgure kao i ulomak posude za topljenje metala. Sa obzirom na količinu zapune, arheološki materijal je malobrojan.

Jama 8/10, dimenzija 0,30 x 0,36 m i dubine 0,33 m, je takođe pronađena ispod ložišta peći iz perioda 4 i nalazi se tik pored jame 7/10. Oivičena je većim kamenjem. Njena zapuna je tamnocrvena rastresita zemlja pomiješana sa usitnjenim kamenjem, a sadrži i nešto arheološkog materijala (jedan ulomak keramike i stakla i jedan gvozdeni klin). Jama se razlikuje od prethodno opisanih, te je možda služila za učvršćivanje nakovanja ili debla u funkciji stuba.

fill was dark brown in colour, due to small amounts of soot. In that layer of the fill there were more fairly large bones, brick, stone and smaller mortar clumps. The material, especially the pottery and metal waste, suggested that these two layers of the fill were of the same kind. The fill was very rich in archaeological material. Of the ceramic finds, fragments of a Corinthian cup (Fig. 4) and a fragment of a vessel of the East-Mediterranean *sigillata B II* kind dated the pit to a wide interval of time from the 2<sup>nd</sup> to the 4<sup>th</sup> century. The brim of a pot was discovered, orange on the outside and grey on the inside, subsequently used for foundry purposes and a piece of slag remained glued onto the inside of its neck (ib. 96). Glass finds were rare, and a fragment of a handle resembled the handles of glass pitchers from the 4<sup>th</sup> century. Metallurgical waste was represented as much as by the abundance of larger and smaller lumps of slag and iron nails as much by the quantity of smaller bronze and iron objects (broken parts of an iron plating, iron and fragmented bronze sheets, bronze wire, etc.). Only one object was possibly made of lead. Fragments of technical ceramics were also numerous. Of these we were only able to identify the vessels for metal casting, while for the rest of the fragments we were unable to determine their use (parts of a furnace, slag with the impression of a moulding vessel). All the fragments had been deformed by strong temperature, they had lots of bubbles of gas inside and were light. The observed similarity with material from the ancient city of Xanten (*Colonia Ulpia Traiana*) confirmed that they mostly belonged to fragments of slag which filled the casting vessels. (Rehren, Kraus 1999: 266, fig 3).

Pit 3/10, circular in shape, measuring from 0.38 m to 0.41 m in diameter and about 0.20 m deep, was located in the north of Pit 2/10. The fill had the same composition as the layer above, that is to say - the layer of dark earth with soot. Right on the surface of the fill large pieces of slag, a few fragments of technical ceramics and, by the western wall of the pit, the most perfectly preserved vessel for metal casting were found.

Pit 4/10, also circular in shape, measuring about 0.52/0.54 m in diameter, 0.35 m deep, had a fill of dark earth with soot in which only slag dust and two iron plaques were found out of the entire amount of excavated archaeological material.

Ukop 1/10, pravougaonog oblika, dimenzija 0,62 x 1,25 m, u sjeveroistočnom je uglu prostorijske. Ispunjen je zemljom tamnocrne boje, koja sadrži ulomke opeka (krovnih tegula i imbreksa). Na južnom dijelu ukop je narušio temelj zida 110 (period 1) i na tom mjestu, iznad samog zida, nalazilo se nevezano nagomilano kamenje i grumenje maltera. Zapuna ukopa je bogata arheološkim materijalom. Keramički nalazi, iako usitnjeni, po fakturi imaju kasnoantičke odlike. Ulomak zdjele sjeveroafričke proizvodnje (*ARSW*, Hayes 9A) koji se datuje u II v. govori da je materijal, slično jami 2/10, pomiješan. Osim ovog, povezanost sa jamom 2/10 pokazuju dva ulomka keramike koji pripadaju obodu lonca pronađenog u jami 2/10 (ib. 96). Ulomci stakla nisu brojni, a životinjske kosti su usitnjene i zelenkaste boje. Grupa predmeta, koja svjedoči o preradi metala, posvjedočena je sa nekoliko krupnih grumenja zgre i sitnih grudvi topljene bronzne, bronzanim limom, te ulomcima dvije posude za livenje metala. U zapuni su pronađene i tesere, slične onim iz zapune ukopa 2/10, kao i ulomci zidnog maltera oslikani crvenom bojom. Novci iz jame pokazuju vrijeme IV vijeka.

Ukop 2/10 nepravilnog podužnog oblika prostire se uz južno lice temelja zida 110. Manjih je dimenzija, oko 0,83 x 0,40 m i ima nešto svjetliju mrku boju zapune u odnosu na ukop 1/10. Zapuna sadrži ulomke opeka, usitnjeno kamenje i mnogo grumenja maltera. Pronađeno grumenje maltera nalikuje malteru podloge za mozaik i, pored kreča i pijeska, kao primjesu ima usitnjenu opeku. Dvadesetak povećih (0,02 x 0,02 x 0,03 m) tesera mozaika i velika količina maltera nagovještavaju da se u ukopu našao komad mozaičkog poda. Od ostalog materijala nađeno je nešto malo keramike, stakla i kosti. Ovaj ukop se novcem datuje u sredinu i drugu polovinu IV vijeka.

Ukop 3/10 nije istražen do kraja, jer se podvlači ispod stepenica iz perioda 5, te dimenzije od oko 1 x 0,50 m nisu konačne. Nalazi se u istom nivou sloja crne zemlje sa gari, i u njemu nije pronađen arheološki materijal. Zapunu ukopa čini malter pomiješan sa glinovitom crvenom zemljom.

Jamu 1/09 prečnika od oko 0,65 m i dubine od 0,46 m smo samo hipotetički postavili u ovu fazu perioda 3. Iskopana 2009. godine, datovana je u

Pit 5/10, with identical fill to the previous one, measuring about 0.16/0.18 m in diameter, 0.20 m in depth, lay between Pit 2/10 and Pit 3/10 and the finds contained lumps of slag and metal and a burned animal bone.

Pit 6/10, of irregular shape, measuring 0.13 m × 0.20 m, was dug up only 0.05 m deep in the subsoil. The fill (dark earth with soot) of this shallow pit did not present any archaeological finds.

Pit 7/10 was of irregular ellipsoidal shape, measuring 0.80 m along the north – south axis and 0.53 m on the longest east – west axis. The pit was discovered after removing the firebox of the furnace from Period 4, northwards from Pit 6/10, and its depth varied on a scale between 0.18 m and 0.25 m. What was interesting is that this pit's fill consisted only of ash. The ash was of a light grey colour and contained small pieces - particles of soot, sporadic chips of bronze and a few clumps of slag, as well as a fragment of a vessel for melting metal. Given the volume of the fill, the archaeological material was considered to be meagre.

Pit 8/10, the dimensions of which were of 0.30 m × 0.36 m with a depth of 0.33 m, was also found under the firebox of the furnace from Period 4, and was situated right next to Pit 7/10. It was outlined with larger stones. Its fill was composed of dark-red loose soil mixed with chopped stone and contained some archaeological material (one fragment of pottery, one of glass, and an iron wedge). The pit was different from the previously described ones and might have been used to anchor an anvil or a tree-trunk used as a column.

Shaft 1/10, rectangular-shaped, measuring 0.62 m × 1.25 m, was excavated in the north-east corner of the room. It was filled with soil of a dark brown colour, which contained fragments of roofing tiles (*tegulae* and *imbrices*). On the south side of it, the shaft had damaged the foundation of Wall № 110 (Period 1) and in that particular spot, precisely above the wall, there were unconnected piled stones and lumps of mortar. The fill in the shaft was rich in archaeological material. The ceramic finds, although fragmented, in the majority of cases showed features of late antiquity, because of their composition. A bowl fragment of North African production (*ARSW*, Hayes 9A) which was dated to the 2<sup>nd</sup> century, spoke of the fact



*Slika 5 - Najkompletniji primjerci posuda za livenje metala iz otpadnih jama i ukopa (foto D. Miljanić)*  
*Figure 5 - The full-scale examples of crucibles from waste pits and shafts (photo D. Miljanic)*

III v. (Baković 2010: 71), ali se doznalo da pored novca III sadrži i novac prve polovine IV v. Ne zna se tačno kakva je njena zapuna bila, osim da je sadržala dosta opeke (Dnevnik iskopavanja 2009: list br 5/n). A veliko dlijeto pronađeno u njoj i pomiješanost numizmatičkih nalaza sugeriraju da se da pripisati istoj fazi perioda 3.

Većinu jama i ukopa karakteriše otpad od metalurških procesa (sl. 6). Iz svih jama je izvađeno oko 3,40 kg tog otpada, što svjedoči o maloj radioničarskoj radinosti. Krupni komadi gvozdene zgure, gvozdeni klinovi i drugi predmeti pokazuju proces kovanja. Drugi potvrđen proces jeste livenje bronce. On je potvrđen i sudovima za livenje metala (sl. 5), bronzanim opiljcima i bronzanom zgurom. Na većini posuda za livenje nalaze se tragovi bronzanog oksida, koji se vizualno tj. golim okom, razaznaju kao zelene mrlje ili kaplje, a izuzetno na jednoj posudi kao mrlje svijetlo crvene boje. I pored bogatstva materijala u njima, jame i ukopi ovog nivoa su otpadnog karaktera, pa kao takve svjedoče o procesu koji se samo posredno veže za rad kovačko-livačke radi-

that the material, similarly to Pit 2/10, was a mixture of ingredients. Beside this, the connection to Shaft 2/10 was confirmed by the two found fragments of pottery belonging to the wall of a pot found inside Pit 2/10 (ib. 96). Fragments of glass were not very numerous and animal bones were fragmented and greenish in colour. A group of objects, serving as proof of the performed activity of processing metals, was evidenced by several large lumps of slag and some small lumps of melted bronze, sheet bronze and the fragments of two vessels for metal casting. In the fill *tesserae* were found, similar to those from the fill of Shaft 2/10, and fragments of mortar from the wall were found, painted red. The coins extracted from the pit point to the 4<sup>th</sup> century.

Shaft 2/10, of an irregular longitudinal shape, stretched along the south face of the foundation of Wall № 110. It was of smaller dimensions, about 0.83 m × 0.40 m, and had a slightly lighter brown fill than Shaft 1/10. The fill contained fragments of brick, chipped stones and many mortar clumps. The recovered mortar nuggets resembled the ones from the foundation of the mosaic and, in addition to lime and sand, the mortar integrated some ground brick as well. Twenty larger mosaic *tesserae* (0.02 m × 0.02 m × 0.03 m) and a large quantity of mortar suggested that there was a piece of mosaic floor inside the shaft. As for the other materials, some ceramics, glass and bones were found. The shaft was dated to the middle and second half of the 4<sup>th</sup> century, courtesy of the recovery of coins.

The investigation into Shaft 3/10 was not completed because it lay partly under the stairs from Period 5, so the given dimensions of approximately 1 m × 0.50 m are not final. It was located on the same level as the layer of dark earth with soot, and no archaeological material was found in it. The shaft fill was a mixture of mortar and red argillaceous soil.

Pit 1/09, measuring about 0.65 m in diameter and 0.46 m in depth, was only hypothetically set in this stage of Period 3. Excavated in 2009, it was dated to the 3<sup>rd</sup> century (Baković 2010: 71), but the analysis of the coins revealed that, beside the coins ascribable to the 3<sup>rd</sup> century, it contained some coins from the first half of the 4<sup>th</sup> century as well. It is not known exactly what its fill was like, except for the fact that it contained a lot of brick (Dnevnik iskopavanja 2009: list br 5/n). Moreover, a large chisel found in it and



*Slika 6 - Metalurški otpad iz jame 2/10 i sloja crne zemlje sa gari (foto D. Miljanić)*  
*Figure 6 - Metallurgical waste from pit 2/10 and black soil layer with charcoal (photo D. Miljanic)*

onice. Jedini elementi koji bi se mogli povezati direktno sa djelatnošću radionice su nažalost presječeni konstrukcijom od opeka iz perioda 4 pri središnjem dijelu južnog zida (prosuta bronza i jako zapečena zemlja). Tako djelatnost radionice ostaje neodređena, naročito što se tiče vremena u kom traje. Pronađeni materijal se datuje od II do IV v. Dodatnu pometnju su načinili jama 1/10 i ukop 1/10 čija direktna povezanost s jamom 2/10 produžava nastajanje ove faze sve do kraja IV v. Ovakva pomiješanost materijala navela nas je da pretpostavimo da su cjeline zatvorene, tj. nastale tako što je prostor u drugoj polovini IV v. počišćen, metalurški šut zakopan u otpadne jame i iznivelisan za sledeći period življenja. Time bi se njen rad mogao odvijati s početka IV v. ili nešto ranije tokom perioda 2. Ukoliko se ove tvrdnje pokažu tačne, ovu fazu bismo nadalje razgraničili na rad radionice i vrijeme s kraja IV v., kada se radionica zatrpava i nastaju jame i ukopi.

the mixture of numismatic finds suggests that it is attributable to the same stage of Period 3.

Most pits and shafts are characteristic for the waste from metallurgical processes (Fig. 6). From within all of the pits that were explored, about 3.40 kg of waste was dug out, which gives further evidence of a small workshop industry. Large pieces of iron slag, iron nails and other objects appeared, indicating that there was a process of forging taking place there. The second officially confirmed process taking place in the workshop was the process of bronze casting. It was also confirmed by the retrieval of moulds used for metal casting (Fig. 5), bronze shavings and bronze slag. On most casting vessels, traces were found of copper oxide, which were discernable to the naked eye as green spots or drippings and, unusually on one vessel, as bright-red stains. Despite the plentifulness of material found in them, the pits and shafts on this level were of a waste-disposal nature and as such they spoke of a process only indirectly related to the ac-

Koncentracija metalurškog otpada se povećava ka jugoistočnom uglu prostorije 3. To se vidi i na profilu ispod kamenih blokova iz perioda 5, gdje se sloj crne zemlje sa gari podvlači, pa nastavkom arheoloških istraživanja treba očekivati korisnije podatke o datovanju faze 1 perioda 3 u tom dijelu.

U jednom trenutku prostorija je podijeljena pregradnim zidom na dva dijela (period 3 faza 2) (sl. 2). Pregradni zid (zid 310) ima dužinu od 6,90 m, a debljina mu varira od 0,53 m a sa temeljnom stopom i do 0,70 m. Druga faza perioda 3 nije postojala u fazi 1 istog perioda, jer se ostaci jako zapečene zemlje iz faze 1 nalaze u pravcu pregradnog zida, gdje se spaja sa južnim zidom prostorije 3 (sl. 2). To se odnosi samo na rad radionice, koji, kao što smo naveli, nije vremenski opredijeljen, dok se sa otpadnim jamama povezanost nije mogla odrediti. Zid sigurno postoji u trajanju sledećeg perioda, jer je presečen izgradnjom konstrukcije od opeka iz perioda 4. Zbog neodređenog datovanja faze 1, nije jasno u kom vremenu se dešava ova pregradnja, niti koliko je zid bio visok. Sačuvan je samo u temeljnoj zoni, rađen od drugačijeg maltera, i to bez krupnijeg kamenja u sebi. U slučaju da nije ozidan samo u ovom temeljnom nivou, on je u mlađim fazama porušen i na njemu je postavljen kameni blok (period 5, faza 1). Možda je u sledećem periodu iskorišćen kao jači oslonac za laku krovnu konstrukciju?

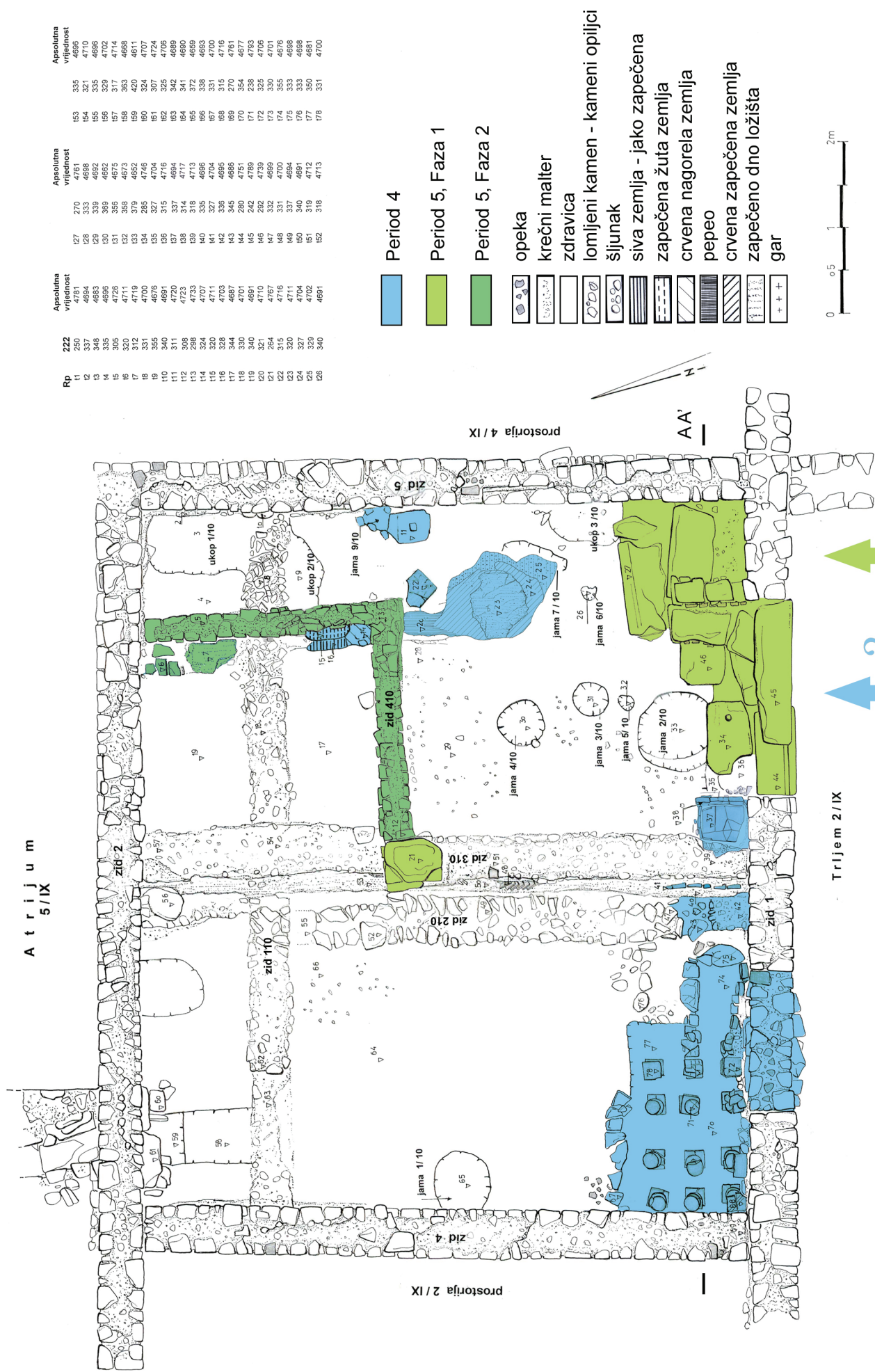
#### Period 4

Period 4 stratigrafski je okarakterisan slojem žutomrke zemlje, koji je ostao nedokopan u pravougaonom dijelu pri istočnom zidu (zid 5) prostorije 3 i kao zapuna u cjelinama, kao što su konstrukcija sa hipokaustom i konstrukcija od opeka. Unutar pomenutog sloja pronađena je baza peći i mnoštvo materijala, koji govori o procesu izrade stakla na ovom mjestu. Ulaz u ovom periodu nije bio moguć za zapadne strane južnog zida, jer su vrata zatrpana i na tom mjestu sa unutrašnje strane je izgrađena konstrukcija sa hipokaustom (sl. 7.1). Da li je ulaz postojao na istočnoj strani, saznaće se kada se nastave istraživanja u tom dijelu. Ostaje mogućnost da je bio podignutog nivoa i

tivity of a blacksmith's/foundry workshop. The only elements that might be related directly to the activities of the workshop were, unfortunately, cut off by a brick construction from Period 4, near the central area of the south wall (spilt bronze and badly burnt soil). Thus, the activity of the workshop remains ambiguous, particularly with regard to the time during which it was active. The found material was dated from the 2<sup>nd</sup> to the 4<sup>th</sup> century. Additional confusion was created by Pit 1/10 and Shaft 1/10, whose direct links with Pit 2/10 extended the time range which the beginning of this stage could have been concurrent with to the end of the 4<sup>th</sup> century. The mixture of materials leads us to suppose that those were closed units, i.e. that they came to be there by means of a clearing up of that same space in the second half of the 4<sup>th</sup> century, by burying the metallurgical waste into the pits and by levelling it down for the next stage in its life. This would place its activity at the beginning of the 4<sup>th</sup> century or a little earlier during Period 2. If these suggestions prove to be accurate, further delineation should be made within the same stage between the time of activity of the workshop and the end of the 4<sup>th</sup> century, when the workshop was covered over and the pits and shafts were made.

The concentration of metallurgical waste increases as one approaches the south-east corner of Room № 3. This can be perceived in the cross-section under the stone blocks from Period 5, where a layer of dark earth with soot lay underneath them, so the resumption of archaeological research should provide useful information about the dating of Stage 1 of Period 3 in that particular zone.

At a certain point, the room was partitioned in two by a wall (Period 3, Stage 2) (Fig. 2). The partition wall (Wall № 310) was 6.90 m long and its thickness varied from 0.53 m up to 0.70 m, including the base. The 2<sup>nd</sup> stage of Period 3 did not exist in Stage 1 of the same period, because the remains of the extremely dry soil from Stage 1 extend in the direction of the partition wall to the point where it joins with the south wall of Room № 3 (Fig. 2). This applies only to the activity of the workshop, which, as we said, cannot be defined in terms of time, while the connection with the waste pits could not be determined. The wall certainly existed during this period, because it is intersected by the brick construction from Period 4. Because of the uncertain dating of



Rp	Apsolutna vrijednost	Apsolutna vrijednost	Apsolutna vrijednost
222	4781	4770	4770
11	250	270	335
12	461	476	321
13	4683	482	153
14	4696	482	154
15	348	429	339
16	4696	482	4696
17	335	339	155
18	305	356	329
19	305	356	4702
20	4726	4726	156
21	4711	4711	317
22	4719	4719	4714
23	312	332	358
24	4700	4700	4673
25	4676	4676	158
26	4700	4700	363
27	4700	4700	4688
28	355	327	4611
29	440	440	159
30	4700	4700	420
31	4700	4700	4611
32	4700	4700	4611
33	4700	4700	4611
34	4700	4700	4611
35	4700	4700	4611
36	4700	4700	4611
37	4700	4700	4611
38	4700	4700	4611
39	4700	4700	4611
40	4700	4700	4611
41	4700	4700	4611
42	4700	4700	4611
43	4700	4700	4611
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46	4700	4700	4611
47	4700	4700	4611
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97	4700	4700	4611
98	4700	4700	4611
99	4700	4700	4611
100	4700	4700	4611

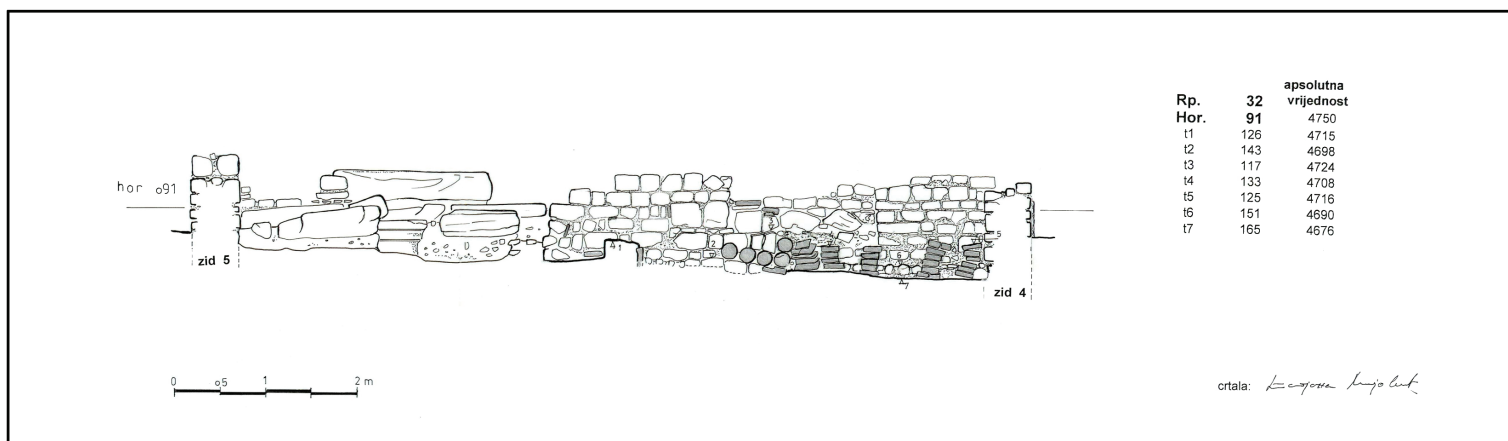
- Period 4
- Period 5, Faza 1
- Period 5, Faza 2
- opeka
- krečni malter
- zdravica
- lomljeni kamen - kameni opiljci
- šjunak
- siva zemlja - jako zapečena
- zapečena žuta zemlja
- crvena nagorela zemlja
- pepeo
- crvena zapečena zemlja
- zapečeno dno ložišta
- gar



Slika 7.1 - Prostorija 3/IX - osnova perioda 4 i 5 faze 1 i 2 (crtež T. Mijović)  
 Figure 7.1 - Room 3/IX - Plan of period 4 and 5 phase 1 and 2 (drawing T. Mijović)

crtao: *T. Mijović*





Slika 7.2 - Prostorija 3/IX izgled sjevenog lica zida 1, istok zapad AA' (crtež T. Mijović)  
 Figure 7.2 - Room 3/IX, Wall No. 1 north face appearance, section east west AA' (drawing T. Mijović)

da se u radionicu silazilo stepenicama, što se razmatra u redovima koji se tiču perioda 5.

Pravougaoni prostor uz istočni zid prostorije 3, dimenzija oko 3,40 x 1,50 m je ostao u prošlim istraživanjima neispitan (sl. 3). Prostor je okarakterisan slojem žuto-mrke zemlje, sačuvane debljine oko 0,12 m, sa velikom količinom sitnih i većih ulomaka opeka, uglavnom krovnih tegula i imbreksa. Na sjevernoj strani navedenog prostora je u prošlim kampanjama otkrivena opeka i poveći kamen, dok je, južno, u središnjem dijelu otkriveno ložište peći (sl. 7.1). Opeka žute boje pečenja leži na sloju žutomrke zemlje i sa gornje strane je isklesana malim nepravilnim zarezima. Odmah istočno od opeke nalazi se kamen nepravilno pravougaonog oblika, dimenzija 0,37 x 0,33/0,48 m, ukopan u sloj žutomrke i u zdravicu. Visinu kamenog bloka od 0,35 m nam je pokazala jama 9/10 koja je i nastala radi njegovog postavljanja. Kameni blok ima gornje lice veoma fino isklesano i, otprilike, po sredini uklesan pravougaonik 0,08 x 0,07 m, dubine 0,03 m. Ostale strane kamenog bloka su polomljene. Smatramo da je kamen sekundarno iskorišćen kao baza drvenog stuba, a pravougaono udubljenje da je služilo za njegovo bolje usađivanje.

Pronađena baza peći (sl. 7.1), odnosno fragmentovano sačuvano ložište peći načinjeno je od zapečene zemlje, čija boja varira u nijansama od crvene i narandžaste do svijetlocrvene. Na osnovu sačuvanog dijela, dimenzija oko 1 x 0,80 m, možemo zaključiti da je ložište imalo elipsoidnu osnovu. Njena gornja konstrukcija najvjerovatnije je bila kalotasta. Samo dno ložišta, najviše sačuvano 0,65 x 0,75 m, blago je ulubljeno. Njena veoma kompaktna košuljica, svijetlo oker boje, sastoji se od tankog sloja zapečene gline koji je nanešen rukama, na šta ukazuju otisci kružnih

Stage 1, it is not clear what period this superstructure belonged to, nor how high the wall was. It was preserved only in the foundation zone, where it is made of a different mortar, without sharp stones in the composition. If it had not been built just up to this foundation level, that would mean that it was torn down in more recent stages and a block of stones was placed on top of it (Period 5, Stage 1). Perhaps in the period that followed it served as a strong support for a rather light roof?

#### Period 4

Period 4 was distinctive for its stratigraphic layer of yellow-brown earth which was not completely removed in the rectangular area by the east wall (Wall No. 5) in Room No. 3 and which served as fill in units such as the construction with a hypocaust and the brick construction. Within the aforementioned layer, the base of a furnace and piles of material were found, suggesting the process of glass-manufacturing taking place. It was not possible to enter here from the west side of the south wall at this stage, because the doors were buried and on that same spot on the inside a structure with a hypocaust was erected (Fig. 7.1). Only by carrying on with research in this area it can be confirmed as to whether there was an entrance on the east side. The possibility remains that it was raised into an upper floor and that it was necessary to descend the stairs to reach the workshop, which was taken into consideration in the section relating to Period 5.

The rectangular area by the east wall in Room No. 3, measuring about 3.40 m x 1.50 m was left unexplored in previous studies (Fig. 3). The area was characteristic for its yellow-brown layer of earth of a preserved thickness of about 0.12 m, which was mixed with large amounts of small and large bricks

pokreta prstiju. Na sjevernoj strani, ložište ima pepeo u širini od 0,29 m, koje ide dužinom od 0,38 m do zida 410, ispod kojeg se podvlači. Na profilu ispod zida 410 u istom nivou, a u pravcu od juga ka sjeveru je ostalo sačuvano od prošlih iskopavanja: crvena zapečena zemlja, nagoreo sloj pepela i zapečena svijetlo žuta zemlja. Ova očuvana situacija, sa sjeverne strane ložišta, pokazuje da se sa te strane najvjerovatnije ložilo. Za opisanu opeku, koja se nalazi odmah istočno pored ložišta peći, tek naknadno pomišljalo se da je korišćena kao mjesto na kome staklar oblikuje staklenu masu. Ona je svega 0,05 m (47,16 m) više od dna ložišta (47,11 m) ali njena isklesana površina nam ne dozvoljava da budemo sigurni u iznesenu konstataciju. U sloju zapečene crvene zemlje ispod podnice nije pronađen arheološki materijal. Sloj žutomrke zemlje je od materijala uglavnom sadržao staklo raznog oblika koje se povezuje sa radionicom. Koncentracija stakla se nalazila južno od ložišta peći a osim staklenih nalaza u sloju žutomrke zemlje pronađeno je malo keramike, usitnjenih životinjskih kostiju i novac Konstantina II, kovan u Sisciji 318-319 god.

U jugozapadnom uglu prostorije 3 u ovom periodu napravljena je konstrukcija sa hipokaustom (sl. 7.1). Prije nego što se konstrukcija počela graditi, vrata na južnom zidu (zid 1) su zatrpana dosta nemarno, bez upotrebe maltera kao vezivnog sredstva. Potom je u uglu prostorije ukopan pravougaoni prostor dimenzija 2,15 x 1,40 m u zdravicu, pri čemu je nivo doveden oko 0,10 m ispod nivoa temelja zidova. Sa sjeverne strane ovog prostora poredano je lomljeno kamenje. Ukopani i ograđeni prostor je iskorišćen za smještanje hipokausta korišćenjem kružnih (dimenzija R-18cm, debljine 0,07 m) i kvadratnih opeka (dimenzija 0,20 x 0,20 m debljine 0,06 m). Kombinacijom opeka formirani su stupci i to gledajući od zapada ka istoku, u tri niza po tri stupca sa kružnim i jedan sa kvadratnim opekama. Stubac sa kružnim opekama, ukupne visine 0,40 m, slasan je tako što su na jednu kvadratnu postavljane četiri kružne, a povrh njih opet jedna pravougaona opeka (sl. 7.2). Iste visine i nivoa (47,16 m) su i tri stupca urađena slaganjem samo kvadratnih opeka. Gornji nivo konstrukcije koji je ležao preko stubaca je načinjen od naslaganih krupnih opeka

fragments, mainly *tegulae* and imbrices. In the northern zone of the aforementioned space, bricks and a large stone were discovered in the course of previous excavation campaigns, while in the southern section the central part revealed the firebox of a furnace (Fig. 7.1). Orange-yellow brick lay on a stratum of brownish-yellow soil and on the top face it was carved with small irregular notches. Directly east of the brick there was a rectangular stone, irregularly shaped, measuring 0.37 m x 0.33/0.48 m, submerged in a layer of yellow-brown earth and into the subsoil. The height of the stone block of 0.35 m was revealed to us by the size of Pit 9/10, which was created in order for that same block to be put up. The stone block's top face was very finely carved and it was distinguished by a rectangle, measuring 0.08 m x 0.07 m, 0.03 m in depth, carved into it somewhere in the middle. The other faces of the stone blocks were cracked. We believe that the stone had a secondary use as the foot of a wooden pillar and that the rectangular hole served to anchor it more firmly.

The discovered base of the furnace (Fig. 7.1), i.e. the preserved fragments of the burner of the furnace, were made of clayey soil, the tint of which varied from red and orange to light-red shades. Based on the preserved segment, measuring about 1 m x 0.80 m, we might reach the conclusion that the furnace had an ellipsoid base. Its upper structure was probably a *calotte*. The very bottom of the firebox, the best preserved one, measuring 0.65 m x 0.75 m, was slightly knocked in. Its very compact cement screed, light beige in colour, was composed of a thin layer of dry clay that was applied manually, as revealed by marks showing a circular movement of fingers. On the north side, the furnace spread ashes 0.29 m round it, which extended to a length of 0.38 m towards Wall № 410, where they lay underneath it. In the cross-section beneath Wall № 410 on the same level in a south – north direction the following items preserved from past excavations were discernible: red clayey soil, a layer of ash and clayey light-yellow soil. On the basis of this preserved layout to the north of the firebox, it might be suggested that this was the area of combustion and a working space. As for the previously described brick which was located directly east next to the furnace burner, it was only later that it was considered to be the place where glaziers shape the glass. The brick was

(dimenzija oko 0,50 x 0,60 m, debljine 0,09 m) koje su većinom potpuno izlomljene. Opeke su prislonjene uz zapadni i južni zid (zidovi 4 i 1) i nakon konačnog urušenja deformisao im se nivo, te je zatečen kako blago pada od juga ka sjeveru. Sa istočne strane hipokausta urađen je kanal dužine oko 1 m i unutrašnje širine od 0,25 do 0,50 m. Kanal je urađen slaganjem krupnijeg kamenja i opeke raznih oblika tako da formiraju dva mala zida (istok-zapad) koji se spajaju sa kvadratnim stupcima. Interesantno je osmišljen južni zidić kanala, gdje su kružne opeke nasatično postavljene i prislonjene uz južni zid prostorije 3 (sl. 7.2). Na početku ložišta je položen krupan kamen koji je usled izlaganja velikoj temperaturi nagorio i napukao. Da je kanal mjesto odakle se ložilo (prefurnijum) potvrđuje i zapuna koja se u tom dijelu sastojala od zapečene zemlje. U istoj ravni širine kanala hipokausta prema istoku presečen je stariji zid 210, a na licu pregradnog zida (zid 310) postavljen je niz opeka, koje nisu solidnije vezane. Ova situacija možda je napravljena radi lakšeg pristupa i stavljanja drva u prefurnijum.

U samoj zapuni unutar konstrukcije sa hipokaustom uočena je razlika. U dijelu gdje se prostire kanal hipokausta zemlja je zapečena, kompaktna, crvenkaste boje sa ulomcima krovnih opeka (neki ukrašeni urezivanjem mreže rombova). U ostalom dijelu zapune naišlo se na zemlju žutomrke boje. Ona se razlikuje od sloja žutomrke zemlje samo u manjoj količini ulomaka opeke i većoj koncentraciji grumenja maltera. Od raznih oblika grumenja maltera uspjeli smo uočiti fasadne košuljice. Zapuna je posebno bogata arheološkim materijalom, naročito usitnjenim životinjskim kostima. Odmah na gornjem nivou zapune, a pored drugog kružnog stupca u sjevernom nizu, pronađena je keramička cijev. Cijev ima oblik šupljeg kvadra najviše sačuvane dužine od 0,20 m, a u presjeku je kvadrat zaobljenih ivica dimenzija 0,09 x 0,09 m. Od keramičkih nalaza u znatnijem broju je otkrivena kuhinjska keramika, a od ulomaka stakla izdvajaju se djelovi hemisferične čaše koja se datuje u IV v. i poveće zrno stakla loptastog oblika. Među metalnim predmetima izdvaja se nož sa trnom (ukupne dužine 0,13 m), uz koji je pronađena i fragmentovana koštana drška i bronzana narukvica od gusto uvijene žice (R-

only 0.05 m higher (47.16 feet) than the bottom of the furnace (47.11 m), but its carved surface did not allow us to be confident about the postulated statement. In the layer of red clayey soil underneath the floor no archaeological material was found. The layer of brownish-yellow soil contained mostly glass in various shapes, which might be associated with the workshop. A certain quantity of glass was located south of the furnace burner and, other than the glass finds, there was also some pottery in the layer of brownish-yellow soil, some smashed animal bones and coins from the time of Constantine II, forged in Siscia in 318-319 AD.

In this stage, in the southwest corner of Room № 3, a construction with a hypocaust was erected (Fig. 7.1). Before starting to build the aforementioned construction, the door on the south wall (Wall № 1) was blocked up quite negligently, without the use of mortar as a binder. Later on, a rectangular area measuring 2.15 m x 1.40 m was dug up in the subsoil in the corner of the room, on which occasion the level was brought up to about 0.10 m below one of the foundation walls. In the north section of this area, broken stones were set in line. The dug-up, enclosed space was used for positioning the hypocaust by means of using round and square tiles (measuring R-18 cm, 0.07 m thick / dimensions 0.20 m x 0.20 m, 0.06 m thick). Using a combination of bricks, columns were made, looking west – east, in three sets of three columns each made with circular bricks, and one made with square bricks. Circular bricks were compiled in order to make a column, the height of which was 0.40 m in total and in such a manner that four circular bricks were adjoined to every square one, with one more rectangular tile on top of them (Fig. 7.2). The three columns made only from square bricks were of the same size and level (47.16 m). The top level of the structure lying over the columns was made out of large stacked bricks (measuring about 0.50 m x 0.60 m, 0.09 m in thickness) that were, in most cases, completely smashed. The tiles were inclined towards the west and the south walls (Walls № 4 and № 1) and after the final collapse their level was deformed, so it was found slightly sloping south – north. On the east side of the hypocaust, a channel 1 m long of internal width 0.25 m to 0.50 m was built. The channel was made out of larger stones and bricks of various shapes, piled in order to make two

0,65 m), koja je, iako polomljena na dva dijela, kompletno sačuvana. Četiri nalaza novca datuju konstrukciju sa hipokaustom u IV v. a jedan u IV/V v.

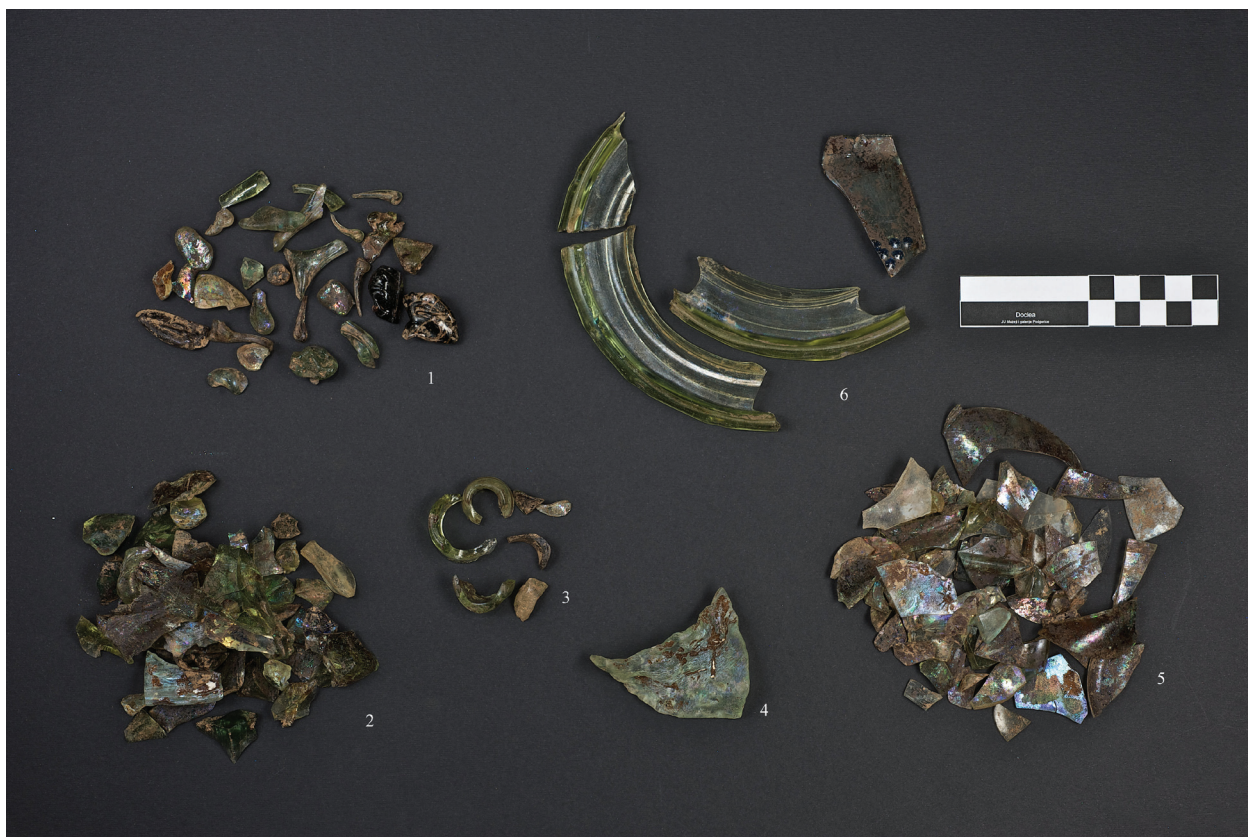
Konstrukcija je rađena bez upotrebe maltera ili nekog drugog vezivnog sredstva, te je u kasnijim periodima dosta stradala. Opeke za njenu izgradnju su se mogle uzeti sa termi preko puta ulice. I pored toga što nalikuje sistemu za podno grijanje, neshvatljivo je zašto bi se grijao tako mali prostor. Budući da se konstrukcija datuje u period funkcionisanja radionice, mišljenja smo da je prije služila za produkciju stakla.

Istočno od hipokausta, na spoju južnog zida (zid 1) sa pregradnim zidom prostorije (zid 310), pronađena je konstrukcija od opeka (sl. 7.1). Prilikom gradnje, njen ukop je presjekao istočno lice pregradnog zida. Napravljena je od opeka žute boje pečenja, tako da liči na malo, plitko korito dimenzija 0,59 x 0,55 m koje se od dna blago širi ka vrhu i ima najveću visinu od 0,23 m. Na dnu konstrukcije položena je veća opeka 0,50 x 0,44 m, sa istočne i sjeverne strane oivčena sa još dvije nasatično postavljene opeke, a sa južne i zapadne zidom. Zapuna unutar konstrukcije, kao što je navedeno, je sloj žutomrke zemlje ispunjen ulomcima krovnih opeka (tegule, imbreksi), iako se na nekoliko centimetara od dna naišlo na žuto-mrku zemlju bez fragmenata opeka. U zapuni otkriven je samo jedan ulomak trbuha lonca, znatno više ulomaka stakla, par kostiju i jedan klin. Nejasna je njena funkcija. Pomišljalo se da je mogla držati vodu, neophodnu tokom rada u radionici. Rađena je od tri opeke, ali na spojevima između i sa zidom nije pronađen hidraulični malter, te nemamo sigurnih dokaza da je korišćena kao korito za vodu.

Nalazi stakla koji neposredno govore o staklarskoj proizvodnji su podijeljeni u dvije grupe: grupa staklenih otpadaka i grupa ulomaka korišćenih kao sirovina za topljenje. U odbačen materijal, tj. staklene otpatke ubrajamo: kapljice stakla radi provjere (sl. 8,1), male kaplje, i ostali rastopljeni otpaci (sl. 8,1), djelovi naglavaka staklarske lule (sl. 8,3), odnosno mali vratovi koji se nakon završetka duvanja otkidaju sa lule. Drugu grupu nalaza čine: komadi stakla (sl. 8,2) i ulomci posuda i ravnog stakla za reciklažu (sl. 8,5). Ovome

small walls (direction east – west), which connected to the square columns. The design of the small south wall of the channel was particularly interesting because the channel was made out of circular bricks set sideways, leaning against the south wall in Room n. 3 (Fig. 7.2). A huge stone was placed on the ledge of the furnace and it was burned and cracked due to exposure to high temperatures. The fact that this channel was a place for combustion (*prefurnium*) was confirmed by the fill which, in that particular area, consisted of clayey soil. On the same plane as the width of the hypocaust channel and to the east a more ancient wall, Wall № 210, was cut through, and a series of loosely linked bricks was set into the front aspect of that partition wall (Wall 310). This situation might have been created for easier access to and placement of wood in the *prefurnium*.

In the fill itself within the structure with the hypocaust a difference was observed. In those parts through which the hypocaust channel extended, the ground was burned, compact, reddish in colour, with fragments of roof tiles (some decorated with an incised mesh of rhombuses). In the remainder of the fill brownish-yellow earth was encountered. It differed from the rest of the layer of brownish-yellow earth only in its smaller quantity of brick chip-pings and a higher concentration of mortar clumps. Amongst the various shapes of mortar clumps, we were able to observe façade claddings. The fill was particularly rich in archaeological material, especially crushed animal bones. Right in the top level of the fill next to the second circular pillar in the north row, a ceramic pipe was discovered. The tube took the form of a hollow square preserved to a length of 0.20 m and in cross-section it was a square with slightly rounded edges, measuring 0.09 m × 0.09 m. From the ceramic finds, a significant amount of kitchen pottery was discovered, and from the glass fragments the parts of a hemispherical cup dating from the 4<sup>th</sup> century and a large spherical glass bead stood out. Among the metal objects, a knife with a tang (0.13 m long in total) might be singled out, unearthed together with a fragmented hilt made of bone and a bronze bracelet made of thickly intertwined wire (R-0.65 m) which although broken in two was fully preserved. Four coins found date the construction with a hypocaust to the 4<sup>th</sup> century, and one to the 4<sup>th</sup>/5<sup>th</sup> centuries.



Slika 8, 1-6 Stakleni nalazi iz sloja žutomrke zemlje (foto D. Miljanić)  
 Figure 8, 1-6 – Glass finds from yellow-brownish soil layer (photo D. Miljanic)

materijalu smo pridodali i nalaze uočene u materijalu pronađenom 2005. i 2009. god. Tako, deformisano parče stakla vatrom (sl. 8,4) iz trećeg otkopnog sloja kopanog 2005. (sm. 61/05) može pripasti prvoj grupi nalaza. Tri ulomka oboda posude prečnika 0,16 m (sl. 8,6) (ib. 58/09), pronađeno zajedno sa grudvicom topljenog stakla u trećem otkopnom sloju 2009., iznad kanala hipokausta (Dnevnik iskopavanja 2009: list br. 6/n). U istom sloju pronađen je ulomak staklene posude s plavim kapljicama (sl. 8,6) (ib. 41/09). Stakleni materijal, iz kese sm. 32/09, otkriven je u unutrašnjem uglu zida 410 u sloju, koji je također vođen kao treći otkopni sloj, je raspoređen u drugu grupu nalaza (sl. 8,2 i 8,5) (Dnevnik iskopavanja 2009: list br. 4/n).

Načini izrade konstrukcija, pregradnja ulaza, ukazuju da se u kasnoantičkom periodu dosta nemarno gradilo. Ne koriste se čvrsta vezivna sredstva, negiraju se temelji prostorije 3 (konstrukcija sa hipokaustom), a materijal se pribavlja na porušanim objektima u okolini. Pribjegava se izgradnji drvenom građom i opekom. Lakom konstrukcijom (kolibom) koja je omogućavala

The construction was put up without the use of mortar or any other binding agent and therefore it ended up being quite badly damaged. The bricks used for its construction could have been taken from the baths which were situated across the street. Although it resembled a system of floor heating, it is incomprehensible why such a constricted area would have needed warming up in the first place. Since the structure dates to the period of activity of the workshop, we believe that it was formerly used for the production of glass.

East of the hypocaust, at the junction of the eastern wall (Wall № 1) with the partition wall of the room (Wall № 310), a structure made of bricks was found (Fig. 7.1). During its construction, its shaft had cut across the east face of the partition wall. It was made of orange-yellow brick, so it resembled a small tray measuring 0.59 m × 0.55 m, slightly widening from the bottom towards the top and reaching a maximum height of 0.23 m. At the bottom of the structure a larger brick measuring 0.50 m × 0.44 m was laid, and it was bordered on both the east and north sides with two bricks laid sideways and with a wall on the southern and western sides. The fill

lakšu ventilaciju prostora, treba objasniti i pitanje odstranjivanja gasova koji su nastajali u toku rada. Nije isključeno da su peć i konstrukcija sa hipokaustom imali i dimnjake. Na osnovu brojnih nalaza novca period bismo opredijelili u IV i V vijek. Ali, pošto je period 3 faza 1 datovan u drugu polovinu IV v. onda i početak perioda 4 treba pomjeriti u kraj IV v. Najpostojaniji dokazi da je period 4 prekrpio period 3 su sačavani na profilu ispod kamenog bloka i ispod ložišta gdje su pronađene jame 7/10 i 8/10. Količina materijala i veličina peći govore da je radionica malog obima, te da su u njoj građani Dokleje podmirivali sopstvene potrebe.

#### Period 5

Najmlađi izdvojeni period je okarakterisan situacijom naslaganih kamenih blokova u jugoistočnom uglu prostorije 3, kamenim blokom na pregradnom zidu i manjim zidom (zid 410) u sjeveroistočnom dijelu prostorije (sl. 7.1). Pošto nisu sagledani svi podaci dobijeni od prethodnih iskopavanja, naročito oni koji opisuju kulturne slojeve koji su uklonjeni u ovom dijelu, ovaj period, za sada, nije moguće bliže vremenski opredijeliti.

Period je podijeljen na dvije faze, ali treba napomenuti da njegova prva faza može pripadati i periodu 4. Ona je izdvojena kao faza posebnog perioda, jer se nije mogla direktno na terenu povezati sa žutomrkim slojem perioda 4 (nivo spušten iskopavanjima 2009.). Dakako, ispod kamenih blokova uočena je vertikalna stratigrafija koja se sastoji od žutomrkog sloja, ispod kojeg se prostire crni sloj (period 3, faza 1) a potom zdravica. Tako, ostaje otvoreno pitanje da li je žutomrki sloj ispod kamenih blokova iznivelisan teren perioda 4 ili su kameni blokovi negirali sloj i život perioda 4. Ukoliko bi istraživanja ispod naslaganih kamenih blokova pokazala da ova faza pripada periodu 4 odnosno staklarskoj radionici, onda bi ulaz sa istočne strane išao preko stepenica, a kamen na sredini pregradnog zida (0,58 x 0,66 m, h - 0,55 m), mogao bi se objasniti, kao i kameni blok sa uklesanom rupom iz perioda 4, bazom lake konstrukcije. Bilo da je nivo ulaza podignut za vrijeme rada radionice ili nakon, naslagani blokovi

within the structure, as noted, consisted of a layer of yellow-brown earth full of shards of roof tiles (*tegulae*, imbrices), although a few inches from the bottom yellow-brown earth without brick fragments was discerned. In the fill only one fragment of the body of a pot was discovered, a significantly greater amount of glass fragments, a few bones and a wedge. The fill's function is not clear. The consideration that it could have been used for holding water, which was essential when working in the workshop, was taken into account. It was made out of three bricks, but no hydraulic mortar was found at the joints between them and with the wall and no definite evidence was found that it had indeed been used as a sump for water.

The glass finds directly asserting the existence of a glass production facility may be divided into two groups: the group of glass waste shards and the group of fragments used as raw material for melting. The discarded material, i.e. the glass waste included: droplets of glass from testing (Fig. 8.1), small droplets and other melted waste splinters (Fig. 8.1), parts of offcuts from the glazier's blowpipe (Fig. 8.3) – the tiny collars which get separated from the glazier's blowpipe after glass-blowing is completed. The second group of finds consisted of: pieces of glass (Fig. 8.2) and fragments of glass containers, and flat glass for recycling (Fig. 8.5). We have added to this material the finds observed among the materials discovered in 2005 and 2009. In this way, a piece of glass deformed by fire (Fig. 8.4) from the third dug-up layer in the excavation campaign in 2005 (sm. 61/05) may be grouped together with the first group of finds. Three fragments of a vessel wall, the vessel's diameter being 0.16 m (Fig. 8.6) (ib. 58/09), were discovered together with the lumps of melted glass in the third layer in 2009 above the hypocaust channel (Dnevnik iskopavanja 2009: list br. 6/n). In the same layer a fragment of a glass container with blue droplets was found (Fig. 8.6) (ib. 41/09). The glass material from bag sm. 32/09 was discovered in the inner corner of Wall № 410 in a layer also recorded as the third dug-up layer and assigned to the second group of finds (Fig. 8.2 and 8.5) (Dnevnik iskopavanja 2009: list br. 4/n).

The methods used for putting up these constructions and the rebuilding of entrances suggested that in the Late Roman period the building was carried

su oformili novi ulaz koji je išao uz sam istočni zid prostorije (zid 5) da bi se onda stepenicama silazilo lijevo (istok-zapad) u prostoriju (sl. 7.1 i 7.2). Interesantno je da su za zidanje ovog ulaza sekundarno iskorišćeni masivni kameni blokovi, dok su spojevi i pukotine popunjene sitnim kamenjem, opekom i malterom lošeg kvaliteta. Od naslaganog kamenja ističu se naopako okrenuta baza stuba, djelovi starijeg praga, djelovi stuba, blok sa manjim uglavnikom napunjenim olovom. Ovo ujedno svjedoči da je objekat IX tada bio urušen i da su arhitektonski elementi sa hrama naknadno korišćeni.

Sigurni pokazatelj da se u prostoriji živjelo nakon prekida rada staklarske radionice jeste faza 2 perioda 5. Omanji zid od opeka (zid 410), jedini predstavnik ove faze, nalegao je na slojeve zapečene zemlje i pepela iz perioda 4 (sl. 7.1). On se naslanja na kameni blok na pregradnom zidu i ide istočno u dužini od 2,6 m, nakon čega se lomi (formirajući na taj način skoro pravilan ugao od 90 stepeni) ka sjeveru i prostire dužinom od 2,9 m do sjevernog zida prostorije 3 (zid 2), gdje su očuvani ostaci najvjerovatnije poda (opeke i malter). Zid je znatno slabije zidan, debljine oko 0,30/0,33 m i sačuvane visine od oko 0,30 m. Pri zidanju u donjem nivou je korišćen pritezan kamen a u gornjem su korišćen krovne opeke, uglavnom žute boje pečenja. Kamen i opeke su vezane debelim nanosom maltera slabijeg kvaliteta, te je zid sklon propadanju. Funkcija zida nije razjašnjena.

### Zaključak

Arheološkim istraživanjima u prostoriji 3 dobijena su saznanja koja pokazuju nekoliko perioda života, a izdvajaju se: period početka života rimskog grada (period 1), period života pomoćne prostorije hrama (period 2), kao i periodi rada dvije radionice za zanatsku proizvodnju (periodi 3 i 4).

Zbog fragmentovanosti sačuvanih podataka ne možemo ništa detaljnije reći o periodima 1 i 2. Period 1 se datuje u drugu polovinu I / početak II v. i zidovi iz tog vremena su porušeni do temelja kako bi bila izgrađena prostorija 3. Neobjašnjivo je da je život tokom perioda 2, u II i III v., tako

out fairly casually. They did not use strong binders, the foundations of Room n. 3 were completely destroyed (the structure with the hypocaust) and the material was obtained from the ruined objects situated in the vicinity. They had recourse to timber and brick for construction. The erection of light edifices (huts), thus facilitating better ventilation, should serve as an explanation for the removal of gasses formed during the work. It is not to be excluded that the furnace and the construction with a hypocaust had chimneys. On the grounds of numerous finds of coins, the period should be attributed to the 4<sup>th</sup> and 5<sup>th</sup> centuries. However, since Stage 1 of Period 3 was dated to the second half of the 4<sup>th</sup> century, the beginning of Period 4 should also be dated to the end of the 4<sup>th</sup> century. The most substantial evidence that Period 4 overlapped Period 3 was preserved underneath a block of stones and below the combustion chamber in cross-section, where Pit 7/10 and Pit 8/10 were discovered. The amount of material and the size of the furnace suggested that the workshop had a limited capacity and was intended for the use of the citizens of Doclea and meeting their local needs.

### Period 5

The most recent selected period was distinctive for the arrangement of stacked stone blocks in the south-east corner of Room № 3, for a stone block on the partition wall and for a smaller wall (Wall № 410) in the north-east part of the room (Fig. 7.1). Having not taken into regard all of the data from the previous excavations, especially those describing the cultural layers that have been removed from this section, it is not possible to set these periods into a definite context of time for now.

The period was divided into two stages, but it is important to point out that its first stage could also be considered part of Period 4. It was set aside as the stage of a specific period because, on the field, it could not be directly linked to the yellow-brown layer from Period 4 (a level lowered by excavations in 2009). Certainly, there was a vertical stratigraphy beneath the stone blocks which consisted of a brownish-yellow layer, under which a black one was present (Period 3, Stage 1) and the subsoil after that. So, the question remains as to whether the yellow-brown layer underneath the stone blocks represent-



Slika 9 - Nadgrobni spomenik sa prikazom kovačke radionice, Aquileia, Italija (foto M. Živanović)  
 Figure 9 - Gravestone with blacksmith workshop display, Aquileia, Italy (photo M. Zivanovic)

siromašno potvrđen, tim prije što u tom vremenu funkcionirao hram koji okuplja sve građane Doleje.

Moguće da je još u tom razdoblju ili, pak, početkom IV v. oformljena radionica za preradu metala. Količina metalurškog otpada govori o maloj radionici koja je mogla da služi za opravku predmeta (kovač) i za izradu nakita (livač). Nije pronađena kovačka peć, a možda je i uništena nastavkom života u prostoriji 3. Nalazi iz otpadnih jama nepobitno govore o kovačkom i livačkom procesu. U prostoriji 3 tada treba zamisliti kovača (*faber ferrarius, ferrarius*) čije je glavno mjesto bilo pored nakovnja i kovačke peći. U ovom slučaju majstor je radio i topljenje metala. Ovaj zanat je zahtijevao da u radionici bude uposlano više ljudi, te bi majstoru pomagali uglavnom pomoćnici (šegrti), koji bi istovremeno učili zanat. Kliješta, čekić, dlijeto, kao što se vidi i na nadgrobnom spomeniku iz Akvileje (sl. 9), činili bi osnovni pribor za rad u ovoj radionici. Međutim svi podaci o radionici su dobijeni posredno, preko materijala iz otpadnih jama, koji se široko datuje od II do kraja IV v. Radionica ne postoji

ed the levelled ground from Period 4 or whether the layer of stone blocks had cancelled the layer and life of Period 4. If the research into the terrain beneath the pile of stone blocks should prove that this stage is related to Period 4 or to the glass workshop, then the entrance on the east side would definitely lead across the stairs and the stone in the middle of the partition wall (0.58 m × 0.66 m, h - 0.55 m) could be accounted for, as would the stone block with the carved hole from Period 4, the base of a light construction. Whether the entrance level had been raised during the operation of the workshop or afterwards, the stacked blocks did form a new entrance that was situated close to the east wall of the room (Wall № 5), so that the stairs could then be descended to the left (in the east – west direction) towards the room (Fig. 7.1 and 7.2). It is interesting to notice that massive stone blocks were put to a secondary use for the construction of this entrance, while the joints and cracks were filled with small stones, brick and mortar of poor quality. From the stacked stones, a pillar base standing upside down, more ancient parts of a threshold, pillar sections and a block with a smaller embedded segment filled with lead stood out. This also demonstrated that Building IX was at the time

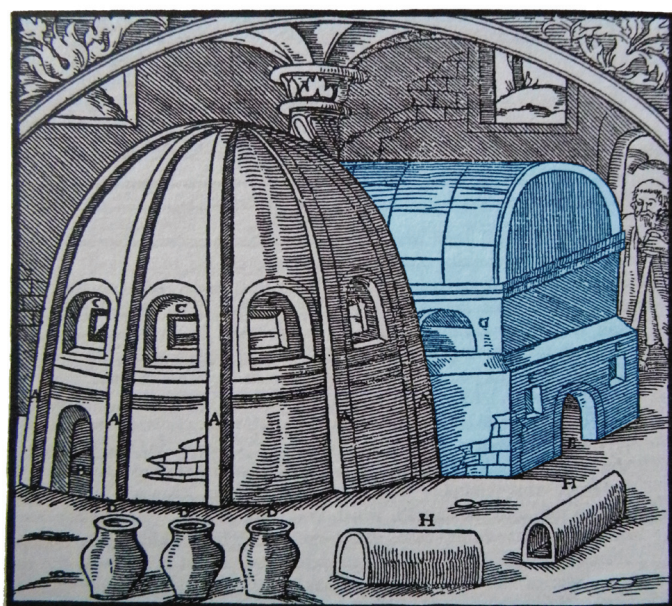


u vremenu kada se period 3 faza 1 zatvara (druga polovina IV v.) tj. kada se prostor niveliše i kada nastaju ukopi i jame. I sledeću fazu perioda 3, kada se prostorija dijeli pregradnim zidom na dvije odaje, moguće je datovati tek kada se odredi prethodna. Stoga period 3, iako postojanije sagledan, jednako ostaje nedorečen, naročito pri određivanju vremena rada i vremena razgradnje radionice. Najzad, datovanje rada ove radionice će omogućiti odgovore i na druga pitanja: zbog čega na ovom mjestu nastaje radionica, da li je produkcija radionice najprije bila za hram, ili da li je tada funkcija hrama zanemarena.

Nakon gašenja radionice za preradu metala, život u prostoriji 3 se nastavlja u kasnoantičkom periodu (period 4), koji je najbolje posvjedočen. Novcem se period vremenski opredjeljuje u IV i V v. ali na osnovu datovanja vremena zatvaranja faze 1 perioda 3, datovanje se pomjera u drugu polovinu IV i V v. U ovom periodu funkcionisala je staklarska radionica. Na osnovu prikupljenih podataka, pretpostavljamo da je prostorija već tada bila dosta urušena, te je radionica napravlje-

partially in ruins and that architectural elements related to the temple were subsequently used.

Sure indications of the fact that the room was lived in after the interruption of the glasswork's activity were provided by Stage 5 of Period 2. A smaller brick wall (Wall № 410), which was the only one representing this stage, leaned against the layers of burnt soil and ashes from Period 4 (Fig. 7.1). It sloped towards the stone block on the partition wall and extended 2.6 m to the east, breaking afterwards (almost forming a right angle in this manner) to the north and extending to a length of 2.9 m up to the northern wall of Room № 3 (Wall № 2), where is preserved surface of mortar and piled bricks (perhaps arranged so as to make a pavement). The wall's method of construction was significantly worse - the wall was about 0.30/0.33 m thick and of a preserved height of about 0.30 m. In the course of the erection procedure at a lower level a subsequently hewn stone was used and on the top level mainly roof tiles were used, mostly orange-yellow in colour. The stone and bricks were bound together by use of a thick layer of poor quality mortar, such that the wall was prone to decay. The purpose of the wall was not clarified.



A—ARCHES OF THE SECOND FURNACE. B—MOUTH OF THE LOWER CHAMBER. C—WINDOWS OF THE UPPER CHAMBER. D—BIG-BELLIED POTS. E—MOUTH OF THE THIRD FURNACE. F—RECESSES FOR THE RECEPTACLES. G—OPENINGS IN THE UPPER CHAMBER. H—OBLONG RECEPTACLES.

*Slika 10 - Prikaz srednjovjekovne kalotaste staklarske peći, u drugom planu peć za blađenje gotovih proizvoda (prema Agricola 1950: 591)*

*Figure 10 - Display of a medieval calotte glass furnace, cooling furnace for finished products in the back ground (according to Agricola 1950: 591)*

## Conclusion

Through archaeological research into Room № 3, data was obtained on specific periods of life including: the early period of the life of a Roman town (Period 1), the period of life of an auxiliary room inside the temple (Period 2) and the periods of activity of two handicraft workshops (Period 3 and Period 4).

Because of fragmentation of the preserved data, we can not supply any more details on the subject of Periods 1 and 2. Period 1 was dated to the second half of the 1<sup>st</sup> / early 2<sup>nd</sup> century and the walls from this period had been destroyed to ground level in order to build Room № 3. It is inexplicable that life during Period 2 in the 2<sup>nd</sup> and 3<sup>rd</sup> centuries is so poorly substantiated, the more so because at that time the temple was operational and brought together all the citizens of Doclea.

However, it is possible that even during this period or in the early 4<sup>th</sup> century a workshop for metal processing was set up. The quantity of metallurgical waste suggests the location of a small workshop

na korišćenjem drvene građe, možda pravljenjem nastrešice ili neke slične lake konstrukcije. Otkrivena staklarska peć odnosno ložište peći nam nudi ograničene podatke o njenom izgledu. Peći su uglavnom zidane opekom ili kamenom do visine prikladne za rad. Jedini podatak koji možda govori kako je peć bila izgrađena u gornjem nivou je kamen sa ostatkom rastopljene staklene mase, pronađen u šutu, nedaleko od sjeveroistočne ivice hrama. U prostoriji 3 nemamo niti jednu sličnu potvrdu, pa će izgled staklarske peći ostati neriješen. Za konstrukciju sa hipokaustom originalnog sklopa smatramo da je takođe imala primjenu u proizvodnji stakla, tačnije da je služila za hlađenje gotovih proizvoda na nižim temperaturama. Naime, Agrikola u XVI v. navodi da su staklari istovremeno koristili i po tri peći, od kojih je jedna služila za postepeno hlađenje gotovih proizvoda da ne bi u suprotnom napukli (Agricola 1950: 586-587). U njoj smo uvidjeli sličnost sa konstrukcijom sa hipokaustom. Kako je autor opisuje, ona ima pravougaoni oblik dimenzija 2,5 x 1,8 m i rađena je na dva nivoa - u donjem se ložilo, a u gornjem hladile staklene posude (sl. 10) (Agricola 1950: 588). I pored sličnosti, nemarna gradnja konstrukcije sa hipokaustom, te njena udaljenost od peći, veličina u odnosu na proizvodnju, ostavljaju mogućnost greške u ovoj interpretaciji. Sa druge strane, stakleni materijal potvrđuje sve procese izrade stakla slobodnim duvanjem. U ovoj radionici, za razliku od pretходne iz perioda 3, mogao je raditi pojedinac. Majstor je prvo nabavljao sirove komade stakla u formi ingota, a koristio je i slomljene djelove predmeta za ponovno topljenje. Otpočinjao bi testiranjem stakla, tako što bi male uzorke stakla topio. Ako bi se oni zadovaljajuće topili, onda bi uzimao koliko mu je dovoljno od tog stakla i stavljao na zagrijan kraj duge gvozdene šipke - lule. Masu bi topio i oblikovao na ravnoj ploči i tek onda bi pristupio duvanju. Mjehur, koji bi se duvanjem stvorio, morao je neprekidno da okreće, sve dok se ne dobije željeni oblik predmeta. Tada bi staklar makazama otkinuo proizvod i ostavio ga da se postepeno hladi u peći, a ostatak sa lule bacio.

Istraživanja posljednjih godina otvorila su nove perspektive u proučavanju antičkog staklarstva.

which could have served to repair items (blacksmith) and for making jewellery (metal caster/founder). The forge was not found, and it was perhaps destroyed as life continued in Room № 3. The finds that came out of the waste pits spoke conclusively of forging and foundry processes. In Room № 3, a blacksmith (*faber ferrarius, ferrarius*) should be pictured as occupying the central place next to the anvil and forge. In this case the master craftsman also worked on the melting of metals. This craft required the workshop to employ more people, so the master craftsman would have been assisted mainly by apprentices, who would at the same time have been learning the trade. The pliers, hammer and chisel, as shown on the tombstone from Aquileia (Fig. 9), were the basic work tools in this workshop. However, all information about the workshop was obtained indirectly, through collecting material from waste pits broadly dating from the 2<sup>nd</sup> to the end of the 4<sup>th</sup> century. The workshop did not exist at the point when Stage 1 of Period 3 was drawing to an end (the second half of the 4<sup>th</sup> century), i.e. when the area was levelled and the pits and the shafts appeared. The next stage of Period 3, when the room was partitioned into two chambers by a partition wall is also datable only when the previous stage is set in a definite time context. Therefore, although Period 3 was more concretely researched, it remains incomplete as well, particularly in setting the time of the activity and the time of the tearing down of the workshop. Finally, the solution of the problem of dating the activity of this workshop should provide answers to other questions as well – the question of why the workshop had been situated on this site, whether the production of the workshop was at first intended for the temple, or whether the real role of the temple was neglected at that time.

After closing down the workshop for metal processing, life in Room № 3 continued into the Late Roman period (Period 4), which is the best evidenced period. Coins fix this period's span from the 4<sup>th</sup> to the 5<sup>th</sup> century, but on the basis of dating the closure of Stage 1 of Period 3, the interval shifted to the second half of the 4<sup>th</sup> and the 5<sup>th</sup> century. During this period the glassworks were operational. On the basis of the collected data, we assumed that the room was already quite ruined and that, in accordance, the workshop was built out of timber, perhaps as a

Sve je više otkrivenih ostataka staklarskih radionica kasnoantičkog perioda. Radionice ovog perioda u velikim mediteranskim urbanim centrima, pa i na mjestima koja su izgubila prvobitne funkcije (npr. forum) uobičajen su slučaj (Antonaras 2010: 93-95, Fig. 1). Prema tome, Dokleja se, sa svojom malom staklarskom radionicom, uklapa u sliku kasnoantičkog staklarstva. I nakon prestanka rada u staklarskoj radionici život je nastavljen (period 5), ali ne zna se u kojoj mjeri.

Obilje podataka i materijala koji ukazuju na zanaatske aktivnosti zahtijeva da se priča o radionici nastavi na drugom mjestu. U tom pogledu ostaje nekoliko smjernica koje treba ispratiti: detaljno sagledati dokumentaciju iz ranijih godina iskopavanja, dovršiti iskopavanja u jugoistočnom uglu prostorije, obaviti analize materijala. Na taj bi se način došlo do novih spoznaja, odgovora na zasad otvorena pitanja, a možda bi bila korigovana i neka gledišta izrečena u ovom radu.

hut or a similar light construction. The discovered furnace for glass-manufacturing, i.e. the firebox of the furnace, offered limited information about its appearance. Furnaces were generally built in brick or stone to an appropriate height for working. The only data which might indicate that the furnace was built in the top level was a stone with some remains of melted glass found in the rubble, not far from the north-east end of the temple. In Room № 3 we did not have any similar confirmation, so the appearance of glass furnaces remains an unresolved issue. As for the construction with the hypocaust in its original form, we believe that it also had a use in the manufacturing of glass, namely that it was used for cooling of finished products at lower temperatures. More specifically, Agricola in the 16<sup>th</sup> century stated that glaziers used to operate up to three stoves at the same time, one of which would have been used for the gradual cooling of finished products, which would otherwise have cracked (Agricola 1950: 586-587). We saw a similarity there with the structure with a hypocaust. As described by the author, it was rectangular in shape, measuring 2.5 m × 1.8 m and was built on two levels, the lower being used for stoking the fire and the top one for cooling jars (Fig. 10) (Agricola 1950: 588). Despite the similarity, the negligent construction of the structure with a hypocaust, its distance from the furnace and its size in proportion to the production leave a margin of error in this interpretation. On the other hand, the glass material confirmed all the processes of glass manufacturing by means of free glassblowing. In this workshop, unlike the previous one from Period 3, individuals could also work. In the first place, the craftsman would have purchased the pieces of mother glass in the form of ingots, using fragments of broken items for re-melting as well. He would have started by testing the glass by means of melting small samples of it. If their melting proved satisfactory to him, he would then take the appropriate quantity of that glass and place it on the heated end of a long iron pipe. He would then melt that mass and shape it on a flat plate and only then would he approach the blower. The blow hole, which would thus be created, would need to be continuously rotated until the desired shape of the object was achieved. Then the glazier would shear off the final product, and leave it inside the furnace to cool gradually and the remaining glass on the pipe would be cast away.

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Research conducted in recent years has opened up new perspectives for the study of ancient glasswork, so the discovered remains of glass workshops from the late-Roman period have increased in number. Remains of workshops from that period in large urban centres on the Mediterranean coast, even in places which have lost their original function, like the forums, are a common occurrence (Antonaras 2010: 93-95, Fig. 1). Therefore Doclea, with its small glass workshop, fitted perfectly into the picture of late-Antique glass manufacturing. After the termination of all activities inside the glass shop, life continued (Period 5), but it is not known to what extent.

The plentifulness of information and material pointing to the existence of handicraft activity requires that the story of the workshops be continued elsewhere. In this respect, there are some guidelines to be followed: documentation from the previous years of excavation should be thoroughly examined; the excavations in the south-east corner of the room should be completed; and analysis of the materials found should be carried out. This should yield new insights, answers to certain questions that remain open for the present and perhaps it would allow us to correct the views expressed in this paper.



