

Novi radiokarbonski datumi rane starčevačke kulture u Hrvatskoj

New Radiocarbon Dates for the Early Starčevo Culture in Croatia

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Novi radiokarbonski datumi rane starčevačke kulture potvrđuju početke procesa neolitizacije u prostoru kontinentalne Hrvatske već oko 6000. god. pr. Kr. Kao dokaz tomu su otkrića naselja u Zadubravlju i Slavonskom Brodu, koja pripadaju vremenu početnih stupnjeva razvitka starčevačke kulture – stupnju Linear A. O dugotrajnosti starčevačke kulture svjedoči više od sto evidentiranih naselja iz gotovo svih stupnjeva njezina razvitka od Linear A do završnog Spiraloïd B. Ovo potvrđuje da je tlo kontinentalne Hrvatske bilo integralni dio središnjeg prostora starčevačke kulture i jedan od ključnih u njezinu postanku i trajanju. Tipološke i stilske analize arheološke građe naselja na Galovu u Slavonskom Brodu opredijelile su ga u stupanj Linear A koji je trajao dulje razdoblje. Prva datiranja naselja starčevačke kulture metodom ¹⁴C u Hrvatskoj utvrdila su određeniju vremensku pripadnost Slavonskog Broda i Zadubravlja unutar kronološkog slijeda ranoneolitičkih naselja starčevačkog kulturnog kompleksa. Arheološkom metodom otkrivene su dvije faze izgradnje (vertikalna stratigrafija), dok se treću fazu (horizontalna stratigrafija) jedino moglo utvrditi metodom ¹⁴C. Datiranje stambene zemunice 37 i grobne jame 15 u najmlađe izgrađene objekte u ovom dijelu naselja, omogućilo je po prvi put, znanstveno utemeljen prikaz horizontalne stratigrafije jednog od najstarijih ranoneolitičkih naselja kontinentalne Hrvatske.

Ključne riječi: radiokarbonsko datiranje, rani neolitik, Linear A stupanj, starčevačka kultura, Zadubravlje, Slavonski Brod, Hrvatska

New radiocarbon dates for the Early Starčevo Culture confirm that the process of Neolithization in continental Croatia began already around the year 6000 BC. Evidence of this includes discovery of settlements in Zadubravlje and Slavonski Brod that belong to the initial phases of Starčevo Culture development – Linear A phase. The long duration of the Starčevo Culture is demonstrated by over one hundred recorded settlements from all phases of its development, from Linear A to the closing Spiraloïd B phase. This confirms that the territory of continental Croatia was an integral component of the central Starčevo Culture zone and one of the key such zones in its emergence and existence. Typological and stylistic analyses of archaeological material from the settlement at Galovo in Slavonski Brod established that it belongs to the Linear A phase, which lasted for a considerable period of time. The first radiocarbon dating of a Starčevo Culture settlement in Croatia have determined a more precise chronological status of Slavonski Brod and Zadubravlje within the chronological scale of Early Neolithic settlements of the Starčevo Culture complex. Archaeological methods applied resulted in the discovery of two construction phases (vertical stratigraphy), while the third phase (horizontal stratigraphy) could only be determined using the ¹⁴C dating method. The dating of residential pit-house 37 and burial pit 15 in the most recent structures in this part of the settlement allowed, for the first time, a scientifically-founded portrayal of the horizontal stratigraphy of one of the oldest Early Neolithic settlements in continental Croatia.

Key words: radiocarbon dating, Early Neolithic, Linear A phase, Starčevo Culture, Zadubravlje, Slavonski Brod, Croatia

Razvojem prve neolitičke kulture – starčevačke, počinje dugotrajan proces neolitizacije, ne samo južnapanonskih, nego i europskih prostora. Na tlu kontinentalne Hrvatske otkrivena su naselja vremenske pripadnosti početnim stupnjema starčevačke kulture, što potvrđuje njezin razvitak u ovim prostorima već u pretklasičnim stupnjevima¹, podudarno s razvojem u ostalim regijama rasprostiranja njezinog kulturnog kompleksa (Dimitrijević 1979, 237-251). Ovo je dokaz da je prostor kontinentalne Hrvatske bio integralni dio središnjeg prostora starčevačke kulture i jedan od ključnih u njezinu postanku i trajanju. O njezinoj dugotrajnosti svjedoči više od sto evidentiranih naselja² iz gotovo svih stupnjeva razvitka, od Linear A do završnog Spiraloid B.

Dosadašnja višegodišnja sustavna arheološka istraživanja na Galovu u Slavanskom Brodu otkrila su dio naselja u kojem arheološka građa, prema stilskim odlikama lončarstva, pripada Linear A stupnju starčevačke kulture (Minichreiter 2001, 208-210). Pokapanje mrtvih unutar naselja između stambenih i radnih zemunica bilo je uobičajeno u starčevačkoj kulturi. Međutim, u Galovu je po prvi put otkriven ukopni prostor – jame s pokojnicima i kulturni objekti koji su bili izdvojeni unutar naselja drvenim ogradama, što ukazuje na dosad nepoznat način organizacije života plemenske zajednice. Arheološkim istraživanjima objekata u naselju, izgrađenih jedan iznad drugog, uočene su dvije faze izgradnje, dok je ostalo otvoreno pitanje vremenskog odnosa okolnih samostojećih objekata u naseljenom prostoru. Jedino rješenje mogle su pružiti interdisciplinarnе analize.

Jedna od najpoznatijih i najčešće korištenih metoda za određivanje apsolutne starosti je metoda pomoću radioaktivnog ugljika ¹⁴C. Ova metoda koristi se za određivanje starosti materijala biološkog porijekla, kao što su drvo, kosti, drveni ugljen, žito. Koncentracija aktivnosti ¹⁴C u cijeloj atmosferi i biosferi je približno konstantna, jer je uspostavljena ravnoteža između prirodne produkcije i radioaktivnog raspada tog izotopa. Međutim, nakon uginuća, odnosno smrti organizma, dolazi samo do raspada ¹⁴C, pa se mjerenjem preostale koncentracije aktivnosti ¹⁴C u nekom materijalu može odrediti vrijeme proteklo od prestanka života organizma. Vrijeme poluraspada ¹⁴C iznosi 5730 godina, te se primjenom ove metode mogu odrediti starosti do približno 50 000 godina. Izmjerena ¹⁴C starost se izražava kao konvencionalna ¹⁴C starost u godinama prije sadašnjosti (BP), pri čemu je za “sadašnjost” dogovorom proglašena 1950. godina. Precizna mjerenja pokazala su da se u prošlosti mijenjala koncentracija izotopa ¹⁴C u atmosferi, zbog čega dolazi do određenih odstupanja izmjerene konvencionalne ¹⁴C starosti od kalendarskih godina te je uvedena dendrokronološka kalibracija ¹⁴C starosti. Kao rezultat kalibracije dobiva se vremenski raspon izražen u godinama cal AD/cal BC, s pripadnom vjerojatnošću (Bronk Ramsey 2005).

The development of the first Neolithic culture, the Starčevo Culture, marked the commencement of the long-lasting Neolithization of Southern Pannonia, but also of Europe in general. Settlements from the Early Starčevo Culture were discovered in continental Croatia, which confirms that its development in this region began already in the pre-classical phases¹, parallel to its development in other regions of the distribution of this cultural complex (Dimitrijević 1979, 237-251). This proves that continental Croatia was an integral component of the central Starčevo Culture zone and one of the key areas in its emergence and existence. Over one hundred recorded settlements² from almost all developmental phases, from Linear A to the concluding Spiraloid B, testify to its long duration.

All previous systematic archaeological research at Galovo in Slavonski Brod conducted over many years has uncovered a portion of a settlement, in which the archaeological material – based on the stylistic features of the pottery – place it in the Linear A phase of the Starčevo Culture (Minichreiter 2001, 208-210). Interment of the deceased within the settlement, between the residential and work pit-houses, was customary during the Starčevo Culture. However, in Galovo a burial location was discovered for the first time: pits containing deceased and cult structures that were inside the settlement but separated by wooden fences, which indicates a previously unknown method of organisation of tribal community life. Archaeological research of buildings in the settlement, erected on top of each other, ascertained two construction phases. However, the question of the chronological relationship with the surrounding stand-alone structures in the settlement remained unanswered. Only an interdisciplinary analysis could provide a solution.

One of the best known and most frequently used methods to determine absolute age is the so-called radiocarbon dating. This method is used to determine the age of materials of biological origin, such as wood, bones, charcoal or grain. The concentration of ¹⁴C activities in the entire atmosphere and biosphere is relatively constant, because there is a balance between the natural production and radioactive decay of this isotope. However, after expiration or death of an organism, ¹⁴C only decays, so measurement of the remaining concentration of ¹⁴C activity in a given material can determine the time that has elapsed since the organism ceased living. ¹⁴C has a half-life of 5,730 years, so this method can be used to determine ages up to approximately 50,000 years. Radiocarbon dates are expressed as conventional radiocarbon age in years before present (BP), with the year 1950 deemed to be the “present” by convention. Precise measurements have shown that in the past the concentration of the ¹⁴C isotope in the atmosphere has changed, which leads to certain deviations in the measured conventional radiocarbon ages from calendar years. For this reason, the dendrochronological calibration of radiocarbon ages was introduced. As a result of such calibration, a range expressed in years cal AD/cal BC is obtained, with the associated probability (Bronk Ramsey 2005).

1 Prema podjeli S. Dimitrijevića: pretklasični stupnjevi – monokrom i Linear A, ranoklasični stupnjevi – Linear B i Girlandoid i kasnoklasični stupnjevi – Spiraloid A i B.

2 Brojnim arheološkim rekognosciranjima i zaštitnim arheološkim istraživanjima na trasama budućih autocesta u sjevernoj Hrvatskoj, u proteklih nekoliko godina evidentirano je 30-ak naselja starčevačke kulture.

1 Based on classification by S. Dimitrijević: pre-classical phases – Monochrome and Linear A, early classical phases – Linear B and Girlandoid and late classical phases – Spiraloid A and B.

2 Roughly 30 Starčevo Culture settlements were recorded over the past several years as a result of numerous archaeological field surveys and rescue excavations on future motorway routes in northern Croatia.

Metodom radioaktivnog ugljika ^{14}C obavljene su tijekom 2000. godine prve analize uzoraka ugljena³ iz naselja Galovo u Slavonskom Brodu (Krajcar-Bronić et al. 2004, 229-243). Daljnje analize ugljena iz objekata otkrivenih u istraživanjima 2003., 2004. i 2005. godine potvrdile su vremenske razlike dvije faze izgradnje, no veliko iznenađenje bilo je datiranje jedne stambene zemunice i grobne jame u najmlađu (treću) vremensku fazu u istraženom dijelu naselja.

U prvoj fazi, u kojoj su objekti bili izgrađeni između 6100 i 5700 cal BC (sl. 1-2), obredno-ukopni prostor je u svojem zapadnom dijelu zauzimao mnogo veću površinu unutar naselja, što je vidljivo po položaju dviju drvenih ograda koje su dijelile stambeni od ukopnog dijela naselja. Drvene ograde 7 i 73 okruživale su veliku grobnu jamu 9 s tri pokojnika, zapadni kulni objekt 149 (možda i kulni objekt 17) i južnu zemunicu 205, odvajajući ih od sjevernog dijela naselja. U sjevernom dijelu velike grobne jame 9 (17 x 5 m) bile su izgrađene, uz dva kostura (muškarac 40-50 g. i žena bez glave 35-40 g.)⁴, dvije obredne peći (Minichreiter 1999, sl. 6,8-9). Uz kosture su kao dar pokojnicima bili priloženi lonci i zdjele na nozi obojeni crvenom bojom s tamnosmeđim i bijelo slikanim motivima, tri male žrtvene posudice (minijaturne zdjele na nozi)⁵ i jezičasta kamena sjekira. U južnom dijelu grobne jame kostur muškarca bez glave (dobne starosti blizu 25-30 g.) okruživale su tri skupine glinenog posuđa, među kojima su bile i posude sa slikanim uzorcima. Ispred kostura nađena je grudica okera, mali zoomorfni žrtvenik (Minichreiter 1999, 15, T. 2), žrtvenik četverokutnog postolja sa životinjskim protomama na uglovima (Minichreiter 2002, 18, T. 3,5) i kameno dljeto, ostavljeni kao dar pokojniku. U središnjem prostoru jame, nedaleko njezina ulaza, nađena je skupina velikih lonaca grublje fature, zdjela i zdjela na nozi fine fature, površine obojene crvenom bojom s bijelo i tamno slikanim uzorcima. U posudu se možda čuvala hrana kao dar za pokojnike ili su se ovdje odvijale obredne gozbe. Kulturnom značenju ove skupine posuda pridonose još i kamene alatke među njima. To su četiri klina i dvije trapezaste sjekire, koje ovdje svjedoče o postojanju kulta sjekire, kojeg A. Benac opisuje na Obrima II u Bosni (Benac 1971, 76-77). Ovi predmeti u grobnoj jami su kao simboli moći ukazivali na naglašen položaj pokojnika u plemenskoj zajednici. Ispod skupine posuđa bio je u dno jame ukopan goveđi rog – kulno žrtvovanje životinje. Ovakav običaj označavanja istaknutog položaja jame ili zemunice otkriven je u ranoneolitičkim naseljima u zemunici 10 u Zadubravlju (Minichreiter 1992, 31) i u kući K-1 u Obrima I u Bosni (Benac 1973, 16). Na izgled pokrova iznad ove velike grobne jame upućuju bankovi uz



Sl. 1 Slavonski Brod, Galovo: zračna snimka naselja u fazi istraživanja (snimio M. Hucaljuk)

Fig. 1 Slavonski Brod, Galovo: an aerial photo of the settlement excavation (photo by M. Hucaljuk)

The first radiocarbon dating of charcoal samples³ from the Galavo settlement in Slavonski Brod was carried out in 2000 (Krajcar-Bronić et al. 2004, 229-243). Further analysis of charcoal from the structures discovered during the excavations in 2003, 2004 and 2005 have confirmed chronological differences between the two construction phases, but a major surprise was dating of a residential pit-house and burial pit in the latest (third) chronological phase in the explored portion of the settlement.

In the first phase the structures were built between 6100 and 5700 cal BC (Fig. 1-2). During this period, the ritual/burial zone in the western section occupied a much larger surface-area within the settlement, which is apparent from the position of the two wooden fences that separated the residential section from the burial section of the settlement. Wooden fences 7 and 73 surrounded the large burial pit 9, containing three bodies, the western cult structure 149 (perhaps also cult structure 17), and southern pit-house 205, separating them from the northern part of the settlement. In the northern portion of large burial pit 9 (17 x 5 m), besides two skeletons (male, 40-50 years of age, and headless female, 35-40 years)⁴, two ritual ovens (Minichreiter 1999, Fig. 6,8-9) were built. Next to the skeletons, grave goods were discovered, which consisted of pots and footed bowls painted red with dark brown and white motifs, three small sacrificial vessels (miniature footed bowls)⁵ and a tongue-shaped stone axe. In the southern portion of the burial pit, the

3 Sve analize obavljene su u Laboratoriju za mjerenje niskih aktivnosti, Zavoda za eksperimentalnu fiziku u Institutu "Ruđer Bošković" u Zagrebu.

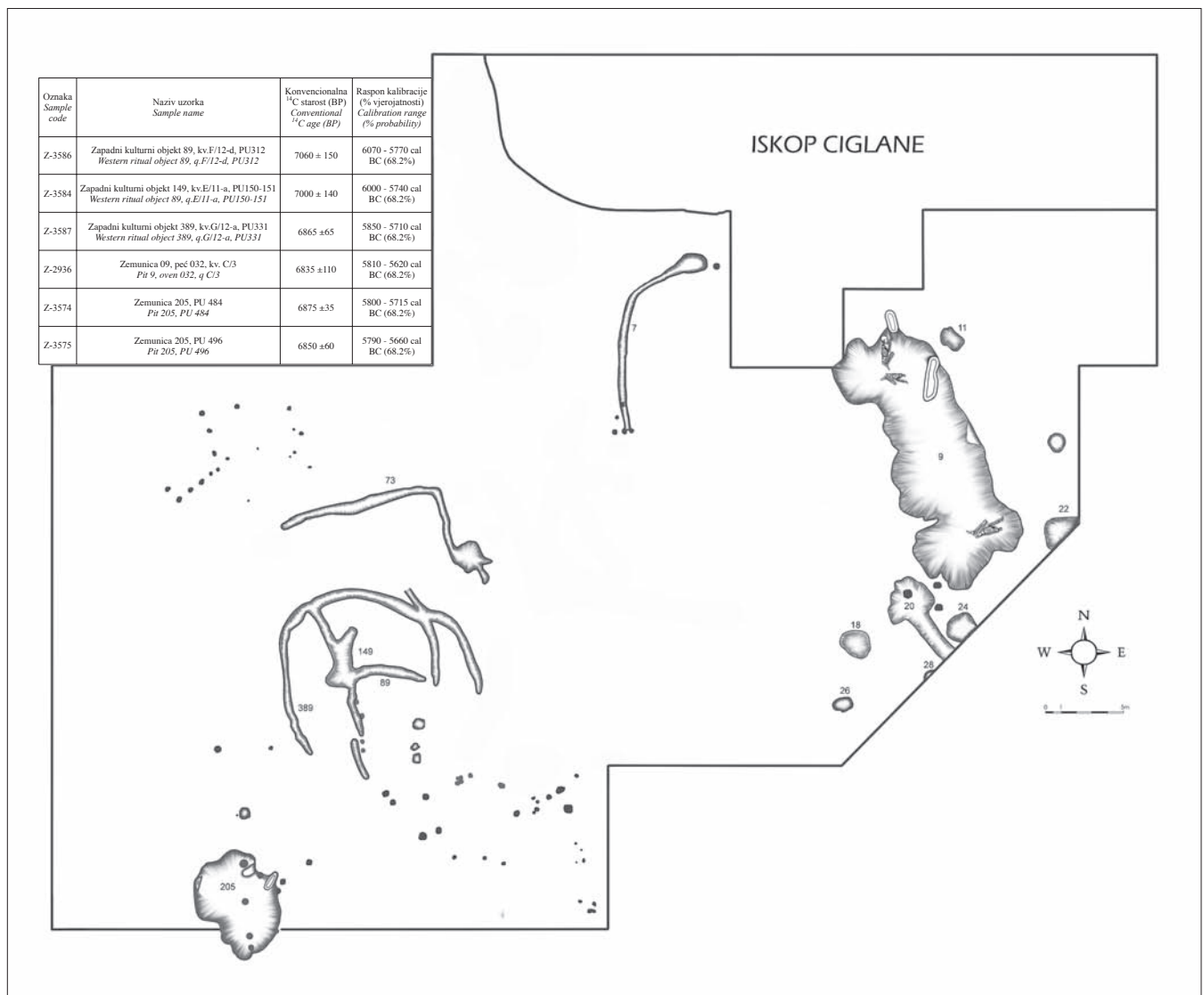
4 Antropološke analize obavili su dr. sc. Mario Šlaus i mr. sc. Mario Novak u Odsjeku za arheologiju HAZU-a u Zagrebu.

5 Valja naglasiti da su žrtvene posudice u obliku minijaturnih zdjela na nozi otkrivene samo uz pokojnike u grobnim jamama, dok su ostali tipovi žrtvenika otkriveni u stambenim i radnim zemunicama. Suprotno tomu, antropomorfnih idola nađeni su samo u stambenim i radnim zemunicama, a niti jedan nije bio priložen uz pokojnike u grobnim jamama.

3 All analyses were conducted in the Low-level Radioactivity Measurement Laboratory of the Ruđer Bošković Institute's Experimental Physics Division in Zagreb.

4 Anthropological analysis was conducted by Mario Šlaus, Ph.D. and Mario Novak, MA in the Department of Archaeology of the Croatian Academy of Arts and Science in Zagreb.

5 It should be noted that sacrificial vessels shaped like miniature bowls on legs were discovered only next to the deceased in burial pits, while the remaining altar types were found in residential and work pit houses. By contrast, anthropomorphic idols were only found in residential and work pit houses, while not one was deposited with the deceased in burial pits.



Sl. 2 Slavonski Brod, Galovo: tlocrt objekata s ¹⁴C datiranjem prve faze u stambenom i ukopnom prostoru (crtež M. Gregl)

Fig. 2 Slavonski Brod, Galovo: layout of the first-phase structure with radiocarbon dates for the residential and burial area (drawing by M. Gregl)

rubove sjevernog prostora. Možda je jama s dva pokojnika u ovom dijelu bila prekrivena vodoravno (ili plitko na dvije vode) složenim oblicima prekrivenim zemljom, slamom ili trskom. Rupe od velikih drvenih stupova uz rub središnjeg prostora vjerojatno su držale šatorastu konstrukciju u kojoj se moglo kretati oko skupine velikog obrednog posuda. Ostaci ugljena iz sjevernog dijela grobne jame datirani su u vrijeme od 5810 do 5620 cal BC.

Zapadno od velike grobne jame 9 bila su dva kulturna objekta (ili samo jedan), od kojih je samo zapadni kulturni objekt 149 i njegova obnovljena konstrukcija datirana metodom ¹⁴C. Dvostruke drvene ograde, za koje pretpostavljamo da su bili kulturni objekti, bile su promjera 15 m, izgrađene tlocrtno u obliku mjesecjeva srpa. Vrijeme nastanka istočnog kulturnog objekta 17 još nije utvrđeno, ali pretpostavljamo da je podignut u drugoj fazi izgradnje naselja nakon prestanka funkcije zapadnog kulturnog objekta 149. Iz prostora zapadnog kulturnog objekta datirani su ostaci ugljena triju različitih dijelova, jer je vidljivo da su bili obnavljani na istome mjestu, ukopavajući

skeleton of a headless male (aged approximately 25-30 years) was surrounded by three groups of clay vessels, including some vessels with painted patterns. In front of the skeleton, a lump of ochre, a small zoomorphic altar (Minichreiter 1999, 15, Pl. 2), an altar with rectangular pedestal and animal protomes at the corners (Minichreiter 2002, 18, Pl. 3,5) and a stone chisel were found. These items were also left as grave goods. In the central area of the pit, not far from its entrance, a group of large roughly shaped pots was found, together with a bowl and a finely worked footed bowl with a red surface and white and dark patterns painted on it. The wares may have been used for holding food that was buried as grave goods, or they may have played a role in ritual feasts that were held here. The significance of this group of vessels for some cult is further enhanced by the stone tools discovered among them. These include four wedges and two trapezoidal axes, which in this context testify to the existence of an axe cult, described A. Benac at Obre II in Bosnia (Benac 1971, 76-77). In a burial pit, these items served as symbols of power and indicated the elevated status of the deceased in the tribal community. Below the group of vessels a bull's horn was buried in the bottom of the pit – indicating an animal sacrifice. This type of

rovove za ogradu jednu nedaleko druge. Tako su uzorci ograde 89 (6070 – 5770 cal BC) i 149 (6000 – 5740 cal BC) nešto stariji od ograde 389 (5850 – 5710 cal BC).

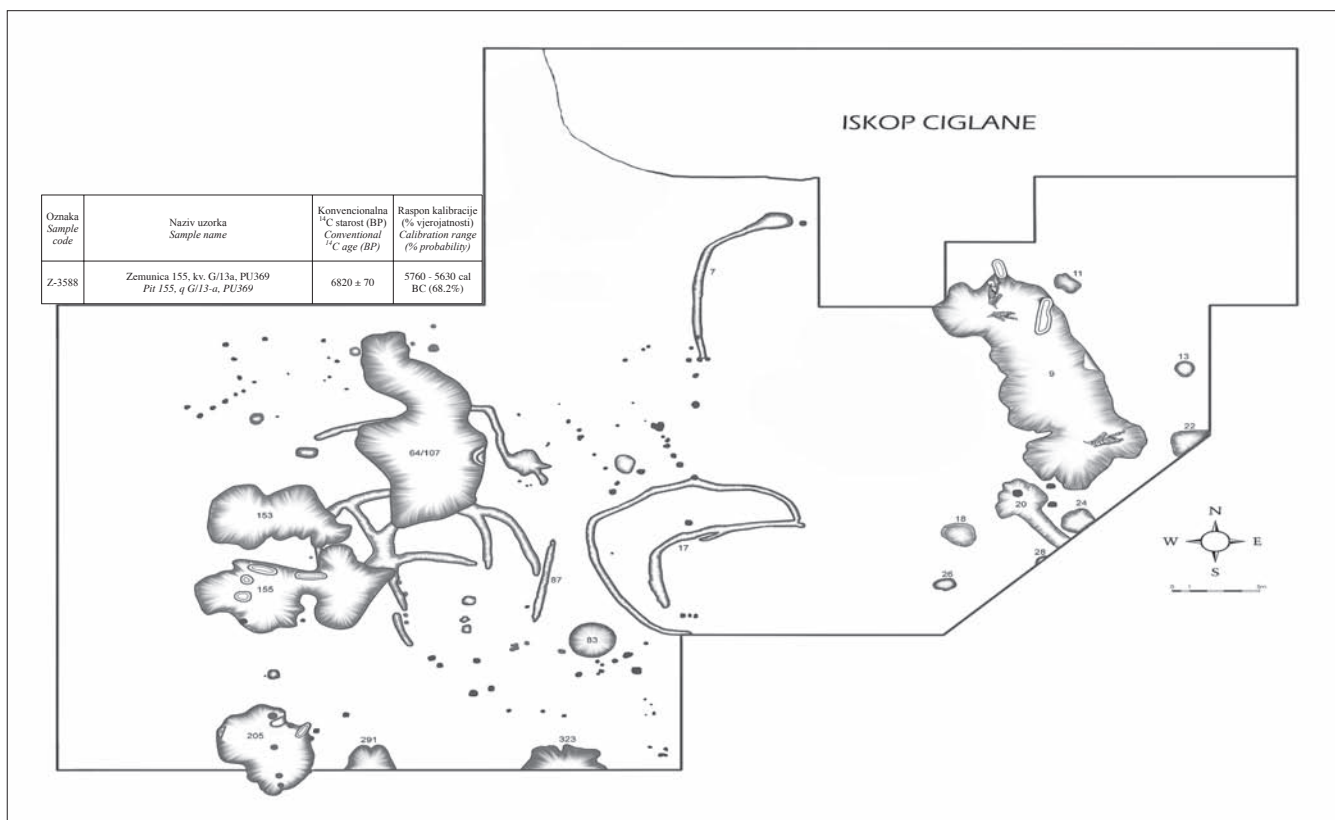
U radnoj zemunici 205, tlocrtne veličine 7 x 5 m, otkriveni su ostaci krušne peći, vertikalnog tkalačkog stana i izdužene lončarske peći. Vrlo praktično i racionalno raspoređeni radni prostori morali su zadovoljavati potrebama obavljanja raznovrsnih poslova, pečenja pogače, glinenog posuđa i izradi tkanina. Kupolasta krušna peć bila je izgrađena uz zapadne stijenke zemunice. Ostaci ugljena u pepelu ispred krušne peći datirani su metodom ^{14}C u 5800 – 5715 cal BC. Na sjevernoj strani zemunice nađeni su ostaci drvenog okvira od vertikalnog tkalačkog stana i dvije skupine glinenih utega piramidalnog oblika (blizu 30 komada). Ostaci drvenog okvira vertikalnog tkalačkog stana datirani su u 5790 - 5660 cal BC. U istočnom prostoru zemunice 205, pored prilaznih stepenica, bila je lončarska peć izdužena oblika, čiji je vrh bio u ravnini gornjeg rubnog dijela zemunice.

U mlađoj fazi, datiranoj blizu 5700 cal BC (sl. 3), naselje se proširilo prema jamama s pokojnicima i time smanjilo površinu ukopnog prostora. Iznad zapadnog kultnog objekta 149 i njegove sjeverne lučne drvene ograde 73, koja je novom izgradnjom izgubila svoju funkciju, bile su izgrađene tri velike zemunice 64/107, 153 i 155. Poštivajući tradiciju i značenje istočnog kultnog objekta, skupina novih zemunica izgrađena je polukružno oko njega, a ne smjerom sjever-jug, što je bilo pravilo u naselju pri izgradnji ostalih zemunica. U toj mlađoj fazi proširenja naselja, između istočnog kultnog

marking of the distinguished position of a pit or pit-house was also observed in Early Neolithic settlements in pit-house 10 at Zadubravlje (Minichreiter 1992, 31) and in house K-1 at Obre I in Bosnia (Benac 1973, 16). Shelves along the edge of the northern part of this large burial pit suggest the possible form of its roofing. The pit containing two bodies in this section may have been covered horizontally or with a shallow pitched roof made of logs covered by dirt, straw or reeds. The holes for large wooden posts on the edge of the central area probably held a tent-like structure that allowed movement around the group of large ritual vessels. The remains of charcoal from the northern section of the burial pit have been dated to the period between 5810 and 5620 cal BC.

West of the large burial pit 9 there were two cult structures (or just one), but only the western cult structure 149 and its renewed construction have been radiocarbon dated. Double wooden fences, which were presumably also cult structures, had a diameter of 15 m and were built in a crescent layout. The time of the construction of the eastern cult structure 17 has not yet been ascertained, but it is assumed that it was erected in the settlement's second construction phase, after the western cult structure 149 fell out of use. The remains of charcoal from three different parts of the western cult structure have been dated, because it is apparent that they were rebuilt at the same site, and that trenches for fences were dug close to one other. Thus samples of fence 89 (6070-5770 cal BC) and 149 (6000-5740 cal BC) are somewhat older than fence 389 (5850-5710 cal BC).

In work pit-house 205, with ground-plan dimensions of 7 x 5 m, the remains of a bread oven, a vertical loom and an elongated pottery kiln were found. The very practically and rationally ar-



Sl. 3 Slavonki Brod, Galovo: tlocrt objekata druge faze s ^{14}C datiranjem u stambenom i ukopnom prostoru (crtež M. Gregl)

Fig. 3 Slavonki Brod, Galovo: layout of the second-phase structure with radiocarbon dates for the residential and burial area (drawing by M. Gregl)

objekta i zemunica izgrađena je nova kratka drvena pregrada 87 radi odvajanja ukopnog od stambenog prostora, koja je više na simboličan nego stvaran način razdvajala ova dva prostora. Naselje starčevačke kulture na Galovu je među najstarijim primjerima širenja stambenog dijela naselja prema prostoru za pokojnike, što je česti slučaj u brojnim naseljima tijekom povijesti, pa i u današnjim velikim gradovima. Stambena i radna zemunica 64/107 dužine 15 m i širine 4–7 m, nije datirana metodom ^{14}C , ali njezina izgradnja sjeverne, manje prostorije, iznad jednog dijela drvene lučne ograde 73, potvrđuje pripadnost mlađoj fazi izgradnje naselja. Zemunica se sastojala od sjeverne i južne prostorije nejednakih dimenzija (Minichreiter 2002, 11-13, sl. 2). Inventar sjeverne prostorije koji je sadržavao 715 kamenih predmeta iz svih faza obrade (obluci, jezgre, odbojci, krhotine, pločice, sječiva, brusno kamenje i sl.) upućuje na pretpostavku da je ovdje bila radionica za izradu kamenih alatki. Raznolikost namjene sjevernog radnog i južnog stambenog prostora potvrđuju i dva ulaza u zemunicu na njezinoj istočnoj strani. Preko jedne stepenice se ulazilo u sjeverni, a preko dvije u južni prostor. Inače, sve zemunice u naselju, bez obzira na njihovu namjenu, imaju samo jedan ulaz na svojoj istočnoj strani. Iako nije datirana metodom ^{14}C , prema položaju sjeverozapadne stambene zemunice 153 u naselju može se zaključiti da je izgrađena u mlađoj fazi naselja. Dužine 9 i širine blizu 5 m, bila je izgrađena svojom istočnom prostorijom iznad zapadnog kulturnog objekta između zemunica 64/107 i 155. U zemunici su bile tri prostorije, od kojih je srednja (najveća) imala ulaz na sjeveroistočnoj strani. Odsutnost peći, tkalačkog stana i kamenih predmeta iz raznih faza obrade kao i raspored i oblik prostorija ukazuju na njezin stambeni karakter (spavaonica). Inventar zemunice sastojao se od raznovrsnog kuhinjskog posuđa grube fature (zdjele, lonci) i finog posuđa - zdjela na nozi i lonaca obojenih crvenom bojom i tamno slikanim motivima. Posebno se ističe desetak žrtvenika četverokutnog postolja, nekoliko stupastih idola, realistički oblikovana glava divlje svinje i figurica srne (Minichreiter 2004, 11-13, sl. 7,1a i b, sl. 8,2-5). Analize ugljena metodom ^{14}C odredile su radnu zemunicu 155 u vrijeme 5760 – 5630 cal BC i opredijelile, pored nje, skupinu susjednih zemunica u mlađu fazu izgradnje naselja. To potvrđuje izgradnja njezine istočne prostorije iznad vanjskog jarka ograde zapadnog kulturnog objekta 149. Zemunica je izgrađena usporedno sa zemunicom 153 s njezine južne strane. Unutar zemunice dužine 11 m i širine blizu 6 (odnosno 7 m), bile su dvije prostorije različite namjene. U zapadnom dijelu radionice bile su četiri peći – dvije lončarske i dvije krušne, a u istočnom radnom prostoru vjerojatno su oblikovani lončarski predmeti tijekom priprema za pečenje. Kod istočnog ulaza u malom prostoru ostaci drvenog okvira i glinenih utega ukazuju da se ovdje proizvodila tkanina na vertikalnom tkalačkom stanu (Minichreiter 2004, 5-18).

Trećoj, najmlađoj fazi ovog dijela naselja pripadaju stambena zemunica 37 i mala grobna jama 15 datirani u vrijeme od približno 5300 do 5000 cal BC (sl. 4). Stambena zemunica 37 bila je izgrađena sjeverno od skupine šest zemunica i sjeverozapadno od ograde 7 u naselju, dok je istodobna mala grobna jama 15 izgrađena nasuprot njoj s unutarnje strane ograde 7

ranged work spaces had to meet the needs of performing various tasks: baking of loaves, firing clay vessels and production of textiles. The dome-shaped bread oven was built along the western wall of the pit-house. The charcoal found in the ash in front of the bread oven was radiocarbon dated to 5800-5715 cal BC. On the northern side of the pit-house, the remains of a wooden frame from a vertical loom were found, together with two groups of pyramidal clay weights (approximately 30). The remains of the vertical loom frame were dated to 5790-5660 cal BC. In the eastern room of pit-house 205, next to the access stairs, there was an elongated pottery kiln, its top level with the upper part of the pit-house.

During its later phase, dated roughly to 5700 cal BC (Fig. 3), the settlement expanded toward the burial pits and thereby reduced the surface area intended for interments. Above the western cult structure 149 and its arched wooden fence 73, which lost its function after new construction, the three large pit-houses 64/107, 153 and 155 were built. Respecting the tradition and significance of the eastern cult structure, the new pit-houses were constructed around it in a semi-circle, rather than in a north-south direction, which was otherwise customary in the settlement when new pit-houses were constructed. In this more recent phase of settlement expansion, between the eastern cult structure and the pit-houses, the new wooden partition 87 was erected to separate the burial and residential areas. The partition served more as a symbolic than actual dividing line. The Starčevo settlement at Galovo is one of the oldest examples of expansion of a residential section of a settlement toward the area for the deceased, which frequently occurred in numerous settlements throughout history, and even in contemporary large cities. Residential and work pit-house 64/107, 15 m long 4-7 m wide, has not been radiocarbon dated, but the construction of its northern, smaller room, above a part of the arched wooden fence 73, confirms that it belongs to a later construction phase of the settlement. The pit-house consisted of northern and southern rooms of different dimensions (Minichreiter 2002, 11-13, Fig. 2). The inventory of the northern room, which contained 715 stone items in all phases of crafting (pebbles, cores, flakes, fragments, platelets, cutting edges, polishing stones, etc.), indicates that this was a stone tool workshop. The diversity of uses of the northern work rooms and southern residential rooms is confirmed by the two entrances to the pit-house on its eastern side. One stair led to the northern room, and two led to the southern room. Otherwise, all pit-houses in the settlement, regardless of their purpose, have only a single entrance on their eastern sides. Even though it has not been radiocarbon dated, on the basis of the position of northern residential pit-house 153 in the settlement, the conclusion may be drawn that it was constructed in a later phase of the settlement. With a length of 9 m and width close to 5 m, it was constructed in such a way that its eastern room stood above the western cult structure between pit-houses 64/107 and 155. The pit-house consisted of three rooms, the middle one (which was also the largest) having an entrance on the north-eastern side. The absence of an oven, loom and stone items in various phases of crafting, and the arrangement and shape of the rooms indicate its residential character (bedroom). The inventory of the pit-house consisted of various coarsely shaped kitchen ware (bowls, pots) and some fine table ware – a footed bowl and red pots with motifs painted in dark colours. Particular attention is drawn by a dozen altars with rectangular bases, several pillar-shaped idols, a realistically rendered pig's head and a figurine of a deer (Minichreiter 2004, 11-13, Fig. 7,1a and b, Fig. 8,2-5). Radiocarbon analysis of charcoal has placed pit-house 155 at 5760-5630 cal BC and determined that, along with it, a group

u ukopnom prostoru. Stambena zemunica 37, dužine 15 m i širine 5 m, bila je u svojem sjeveroistočnom dijelu uništena dotadašnjim iskopom Ciglane.⁶ Raspored unutarnjeg prostora ove zemunice razlikovao se od ostalih stambenih zemunica u naselju po tome što je cijela zemunica bila samo jedna prostorija s plitko ukopanim neravnim dnom podjednake dubine u cijelom prostoru (Minichreiter 1999a, sl. 7-8), što ukazuje da je ovdje najvjerojatnije bila spavaonica za više članova obitelji. Na dnu zemunice nađene su rupe od velikih okomitih stupova, ukopanih u zdravicu 20-30 cm, koji su u pravilnim razmacima od po 2 m bili poredani u nizu po uzdužnoj osi zemunice (smjerom SZ-JI). Na svaki od stupova uzdužne osi nadovezao se pod pravim kutom poprečni niz manjih stupova koji su mogli držati krovnu konstrukciju na dvije vode. U zemunici su, uz brojne ulomke kućnog keramičkog posuđa, otkriveni samo jedna noga žrtvenika i manji «žrtveni stol» - ravna podloga na kojoj je moglo stajati posuđe ili drugi kulturni predmeti. Među litičkim nalazima otkrivena su i dva klina i ulomak klina ili sjekire.⁷ Inventar u zemunici istovrstan je po stilskim obilježjima arheološkoj građi u ostalim objektima naselja. Analize ugljena metodom ¹⁴C datirale su ovaj objekt kao najmlađi u istraženom dijelu naselja u vrijeme oko 5380-5290 cal BC.

Nedaleko stambene zemunice 37 s južne i jugozapadne strane na udaljenosti od 2 m, bila su dva popratna objekta – dvije plitke jame 41 i 43 približno iste veličine. Široka plitka jama 41, dimenzija 2,40 x 1,70 m, bila je ukopana oko 40 cm ispod razine naselja. Stranice jame bile su okomite sa stepenicom na jugoistočnoj strani. U jami su nađeni nizovi rupa od drvenih kolaca koji su iznad ulaznog dijela mogli držati nadstrešnicu. Pretpostavci da je jama bila natkrivena ide u prilog činjenica što je u središnjem dijelu jame otkrivena kružna rupa od okomitog stupa promjera 30 cm. Inventar u jami bio je malobrojan. Nekoliko ulomaka keramike, komadi pečene zemlje s otiscima šiblja, skupina odbojaka i ostaci spaljenih životinjskih kostiju bili su grupirani u jugozapadnom proširenom dijelu jame. U središnjem dijelu jame bio je na dno položen ulomak veće posude na kojem je pomoću trake s otiscima prsta reljefno izveden stilizirani ženski lik s uzdignutim rukama na molitvu (Minichreiter 2000, 9, sl. 1). Jama 41 svojim oblikom kao i malobrojnim inventarom u njoj, ukazuje da to nije bila obična jama za otpatke, nego prostor u koji se moglo ući i boraviti u njemu obavljajući nekakve obrede. Druga jama 43 bila je ukopana na praznom širokom međuprostoru naselja na udaljenosti od oko 3 m jugoistočno od jame 41, približno 2,5 m južno od stambene zemunice 39. Promjera 2 m, bila je ukopana u svojem najdubljem dijelu oko 80 cm od površine naselja. Od površine prema dnu stranice su bile blizu 30 cm, okomito ukopane prema ravnom dnu, dok su na južnoj strani bile oblikovane dvije široke stepenice. Rupe od kolaca nađene su u sredini jame i na njezinom rubnom dije-

of neighbouring pit-houses also belong to a later phase of the settlement's construction. This is confirmed by the construction of its eastern room above the outer ditch of the western cult structure 149. The pit-house was constructed parallel to pit-house 153, on its southern side. Inside the pit-house which is 11 m long and 6-7 m wide, there were two rooms with different purposes. There were two pottery kilns and two bread ovens in the western section of the workshop, while in the eastern work room pottery items were probably shaped while they were prepared for firing. The remains of a wooden frame and clay weights in the small room at the eastern entrance indicate that fabric was made here using the vertical loom (Minichreiter 2004, 5-18).

Residential pit-house 37 and small burial pit 15 belong to the third, most recent phase of this part of the settlement, dated to approximately 5300 to 5000 cal BC (Fig. 4). Residential pit-house 37 was constructed north of the group of six pit-houses and northwest of fence 7 in the settlement, while the contemporaneous small burial pit 15 was made opposite to it from the inside of fence 7 in the burial zone. The northeast portion of residential pit-house 37 of a length of 15 m and width of 5 m, was destroyed by previous excavation of the brick factory.⁶ The interior arrangement of this pit-house differed from the other residential pit-houses in that the entire pit-house consisted of only one room with a shallowly excavated uneven floor of equal depth throughout the room (Minichreiter 1999a, Fig. 7-8). This indicates that there was probably a bedroom here for several members of the family. Holes for large vertical posts were found at the bottom of the pit-house. They were dug 20-30 cm into sterile soil, and arranged in a series along the longitudinal axis of the pit-house (northwest-southeast direction) at uniform distances. A perpendicular series of smaller posts were connected to each of the posts on the longitudinal axis, which may have supported a pitched roof structure. Besides numerous fragments of kitchen ware, only a single altar leg and a smaller "table for sacrifices" (a flat surface on which vessels and other cult items may have stood) were found. Among the stone finds, two wedges and a fragment of a wedge or axe were discovered.⁷ The pit-house's inventory is identical in stylistic terms to the archaeological material found in the settlement's other structures. Radiocarbon dating indicated that this structure belongs to the most recent period of the settlement and placed it to 5380-5290 cal BC.

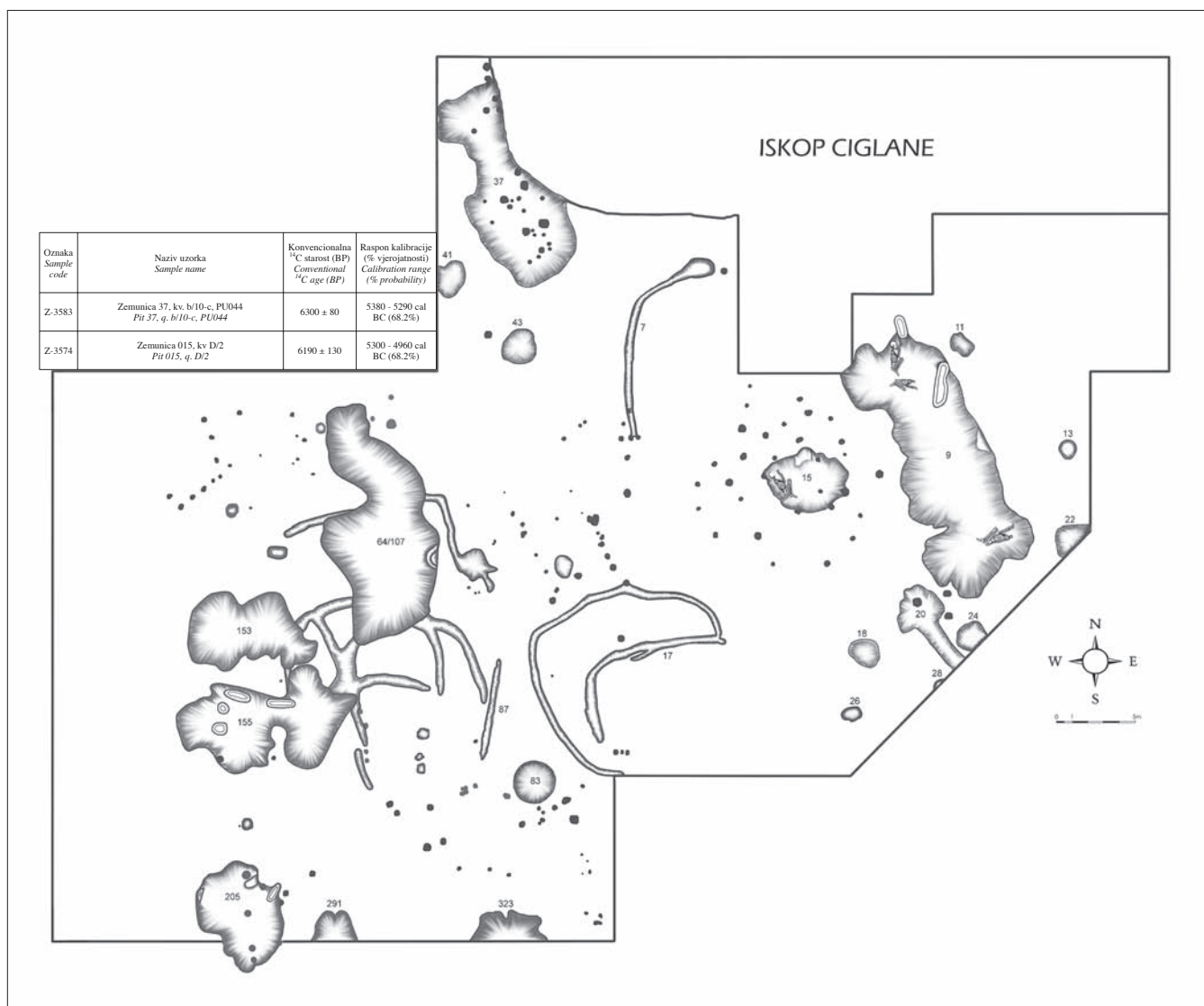
Close to residential pit-house 37, on the south and southwest side, at a distance of 2 m, there were two accompanying structures: two shallow pits, 41 and 43, of approximately the same size. The broad shallow pit 41, of 2.4 x 1.7 m, was dug at approximately 40 cm below the level of the settlement. The sides of the pit were vertical with a step on the south-east side. A series of holes from wooden posts were found in the pit, which may have supported an awning above the entrance. The assumption that the pit-house was covered is backed by the fact that a circular hole was found in the centre of the pit, made by a vertical post with a 30 cm diameter. The inventory in the pit was meagre. Several pottery fragments, pieces of baked earth with reed imprints, a group of flakes and the remains of burned animal bones were grouped in the southwest

6 Do 1997. god. Ciglana je za svoje potrebe koristila zemljište i tako uništila veliku površinu naselja.

7 Analizu i znanstvenu valorizaciju glačanog kamenog oruđa obavila je prof. dr. sc. T. Težak-Gregl, što će kao poseban rad biti objavljeno u monografiji K. Minichreiter, Galovo - Slavonski Brod, deset godina arheoloških istraživanja.

6 Up to 1997, the brick factory used the land and thus destroyed much of the settlement's surface.

7 Analysis and scientific evaluation of polished stone tools were conducted by Prof. T. Težak-Gregl Ph.D. The results of the analysis will be published as a separate work in the monograph by K. Minichreiter, Galovo - Slavonski Brod, deset godina arheoloških istraživanja.



Sl. 4 Slavonki Brod, Galovo: tlocrt objekata treće faze s ¹⁴C datiranjem u stambenom i ukopnom prostoru (crtež M. Gregl)

Fig. 4 Slavonki Brod, Galovo: layout of the third-phase structure with radiocarbon dates for the residential and burial area (drawing by M. Gregl)

lu, pa je i ova jama najvjerojatnije bila natkrivena. Inventar u jami bili su malobrojni ulomci keramike i nešto kamenih izrađevina i to sve zatrpano crnom masnom zemljom – gorevinom. I ova jama kao i susjedna, slična oblikom i inventarom, imala je vjerojatno istu namjenu, isključujući mogućnost da je služila za otpad.

Nasuprot stambene zemunice 37, s unutarnje strane ograde 7, u sjeverozapadnom ukopnom prostoru smjestila se mala grobna jama 15, datirana ¹⁴C metodom kao najmlađi istraženi objekt, u vremenu 5300 - 4960 cal BC. Ova mala grobna jama 15, promjera 5 m i ravnog dna ukopanog 50 cm u zdravicu, bila je izgrađena u sredini prazne površine zapadnog prostora obredno-ukopnog dijela naselja. Udaljena od ostalih objekata dominirala je ovim prostorom, okružena velikom nadstrešnicom i trijemom iznad ulaza, koje su držali nizovi drvenih stupova. Na njezinoj sjevernoj strani bio je preko jedne široke stepenice, oblikovane kao mala platforma, ulaz u grobnu jamu. U zapadnom dijelu bio je pokopan muškarac u dobi 35-40 godina u zgrčenom položaju, tako da

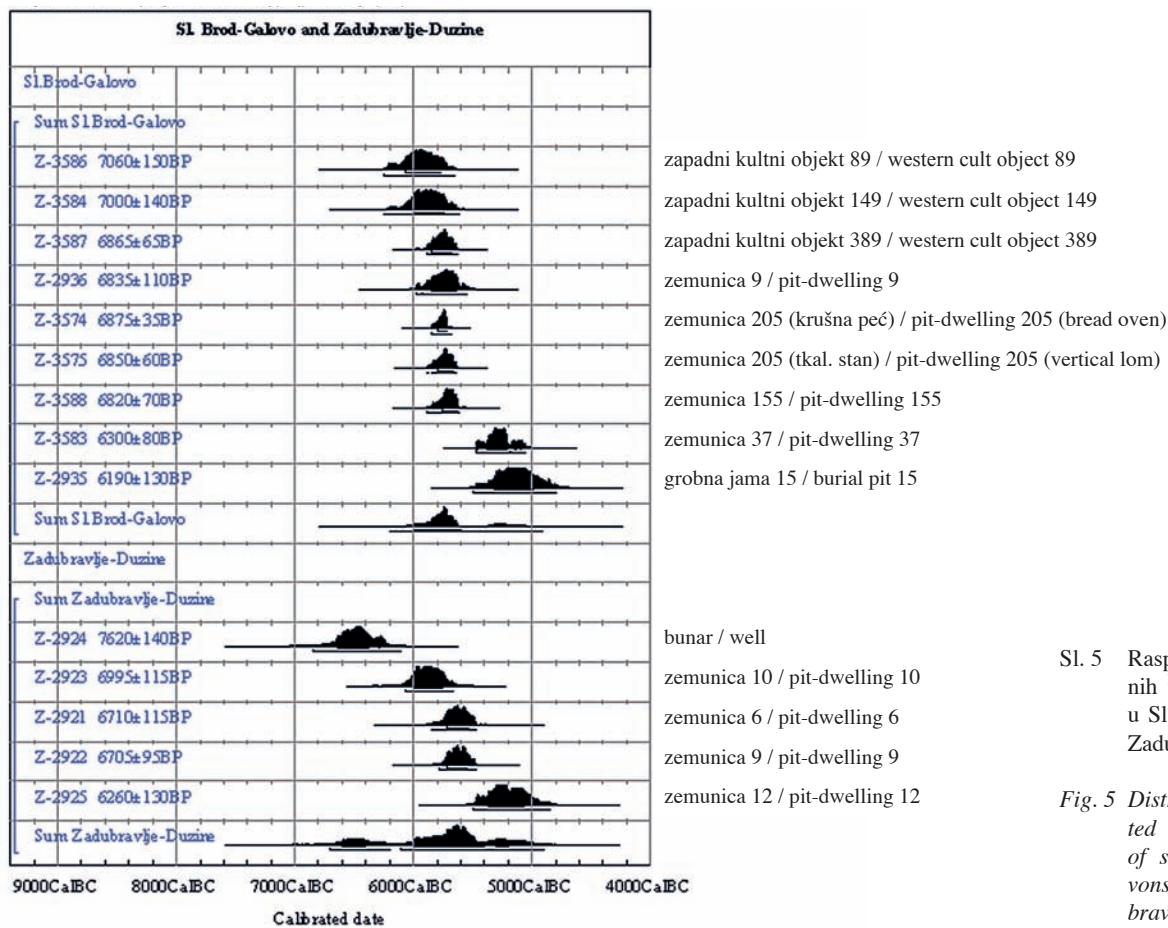
expanded part of the pit. In the central portion of the pit a fragment of a large vessel was placed on the bottom. The vessel was decorated with a finger-impressed band with a stylized female figure with arms raised in prayer rendered in relief (Minichreiter 2000, 9, Fig. 1). The shape and meagre inventory of pit 41 indicate that it was not an ordinary waste pit, but rather a space that could be entered and in which a person could stay to perform certain rituals. The second pit 43 was dug into an empty, broad space within the settlement, approximately 3 m southeast of pit 41 and approximately 2.5 m south of residential pit-house 39. It was dug to a diameter of 2 m at its deepest part, approximately 80 cm from the settlement's surface. From the surface to the bottom, the walls were approximately 30 cm, vertically dug toward the flat bottom, while on the southern side there were two wide steps. Holes for stakes were found in the centre of the pit and at its edge, so this pit was probably also covered. The inventory in the pit encompassed a small number of pottery fragments and some stone items, all buried under black oily soil – soot. This pit, like the neighbouring one, with similar shape and inventory, probably served the same purpose, excluding the possibility that it was used to discard waste.

je ležao na lijevom boku, s glavom na sjevernoj, a nogama na južnoj strani, okrenut prema sredini jame (Minichreiter 2000b, sl. 5). Muškarac je bio ukopan bez lica, jer su nađene samo stražnje kosti lubanje. Kostur je bio zatrpan zemljom izmiješanom s ulomcima grublje i fine slikane keramike, ostacima životinjskih kostiju i s više od 100 komada kamena raznovrsnih oblika i namjene: jezgre, odbojci, brusni kamenovi, drobilice, dijelovi žrvnjeva, sitnih alatki. Zemlja je sadržavala veliki postotak gara (crna masna zemlja), a u njoj su nađeni i komadi pečene zemlje glatke površine, na jednoj strani s urezanim žljebovima neodređenog ornamenta. Identični komadi nađeni su i u velikoj grobnoj jami 9 i to ispod skupina keramike, što ukazuje na mogućnost njihove namjene kao «žrtvenih stolova» za držanje glinenog posuda. Iznad kostura, među ulomcima keramike, nađeni su glineni diskovi s rupom u sredini – po dva u paru, glinena glava patke oko 30 cm iznad ostatka lubanje (Minichreiter 1999a, 7-15) i šest žrtvenih posudica (male zdjelice na nozi). Na zapadnoj strani ulaznih stepenica otkrivena je skupina od šest glačanih kamenih sjekira i klinova različite veličine, što upućuje na mogućnost obrednog prilaganja kamenih predmeta (nisu bile upotrebljavane) odmah pokraj ulaza u grobnu jamu. Sjekire i klinovi su mogli biti priloženi pokojniku svi odjednom pri ukopu ili su prilagane jedna po jedna pri posjetu pokojniku u određenim vremenskim razmacima, što i u ovoj grobnoj jami kao i u susjednoj grobnoj jami 9, ukazuje na postojanje kulta sjekire. Ovakva vrsta priloga uz pokojnika u maloj grobnoj jami možda upućuje na njegov istaknut položaj u plemenu. Tomu u prilog ide i činjenica da je u zemunici ukopana samo jedna individua. Inače se u grobnim jamama starčevačke kulture uvijek ukopavaju zajedno skupine pokojnika. Prema ostacima rupa od stupova vidljivo je da je iznad ove grobne jame bila velika nadstrešnica i iznad ulaza posebno natkriti trijem, što je davalo grobnoj jami posebno svečani karakter. Ostaje otvoreno pitanje ukopa pokojnika bez lica. Ovakav ukop možda je uzrokovan vjerovanjima da se na taj način oduzima njegova moć djelovanja na ostale članove plemena, pod pretpostavkom da je bio vođa plemena ili vrač. Na mogućnost povezanosti male ukopne jame 15 i stambene zemunice 37 ukazuje nekoliko činjenica, između ostalog i datiranje u najmlađu fazu naselja i njihov blizak položaj s nasuprotne strane ograde 7. Pritom treba naglasiti da su među svim stambenim i radnim zemunicama u naselju jedino u stambenoj zemunici 37 otkrivena dva klina i ulomak glačane sjekire. Pored toga, nađen je još jedan ulomak klina (sjekire?) uz ogradu 7, koja se nalazila između zemunice 37 i grobne jame 15. Sve ovo upućuje na pomisao kako je u stambenoj zemunici 37 živjela obitelj pokojnika ukopanog u grobnoj jami 15, za kojeg pretpostavljamo da je bio istaknuti član plemena (možda vođa ili vrač).

Rezultati mjerenja uzoraka ugljena iz starčevačkog naselja u Zadubravlju pokazali su vremenski raspon objekata u istraženom dijelu od 6600 do 5300 cal BC (sl. 5). Stilsko opredjeljenje arheološke građe iz Zadubravlje i Slavonskog Broda u isti stupanj Linear A potvrdilo je datiranje metodom ¹⁴C, pa zbroj kalibriranih datuma za Zadubravlje iznosi blizu

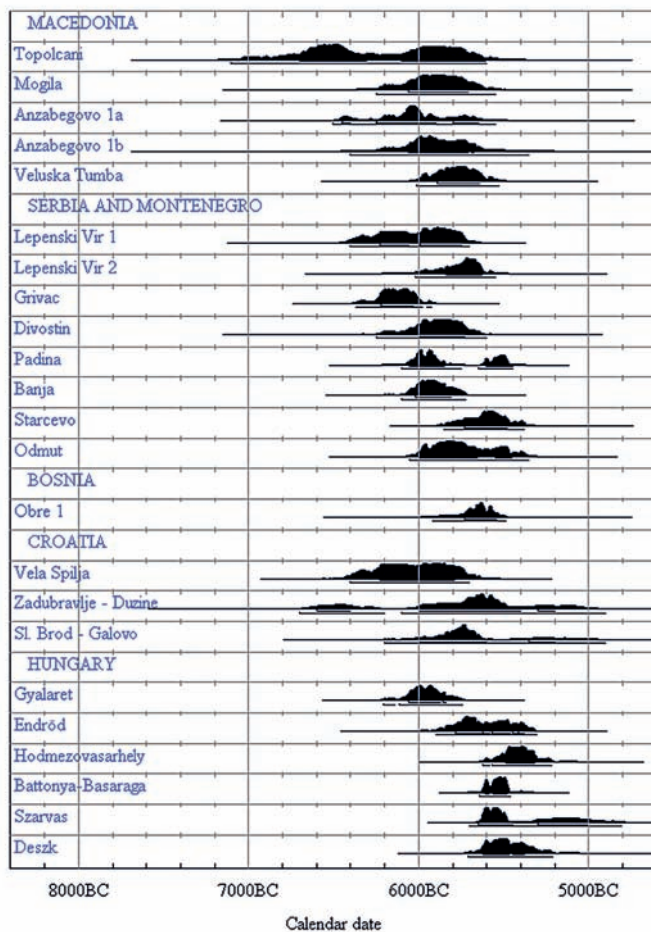
The small burial pit 15 is located just opposite to residential pit-house 37, inside fence 7 in the north-western burial zone. It has been radiocarbon dated to 5300-4960 cal BC, which makes it the most recent explored structure at this site. The small burial pit 15, with a diameter of 5 m and a flat bottom, dug in 50 cm into sterile soil, was made in the centre of an empty surface in the western part of the settlement's ritual/burial zone. Separated from the other structures, it dominated the area, surrounded by a large canopy and porch above the entrance, supported by series of wooden posts. The entrance to the burial pit was located on its northern side over a wide step, shaped like a small platform. In the western portion a man aged 35-40 was buried, in a contracted position, lying on his left side, with the head toward the north and legs toward the south, facing the centre of the pit (Minichreiter 2000b, Fig. 5). The man was buried without his face, as only the rear skull bones were found. The skeleton was covered by soil mixed with fragments of coarse and fine painted pottery, animal bone remains and over 100 pieces of stone of various shapes and uses: cores, flakes, polishing stones, crushers, parts of grindstones, small tools. The soil contained a large percentage of soot (black oily soil), and pieces of fired, smooth earth were also found in it. The latter had grooves of some undetermined ornamentation engraved on one side. Identical pieces were found in large burial pit 9 under a group of pottery, which indicates the possibility that they were used as "sacrificial tables" to hold clay vessels. Above the skeleton, between pottery fragments, clay disks with holes in the centre, two in a pair, were found; along with a clay duck's head that was discovered roughly 30 cm above the skulls remains (Minichreiter 1999a, 7-15) and six small sacrificial vessels (small footed bowls). On the western side of the entry stairs, a group of six polished stone axes and wedges of varying sizes were found, which indicates the possible ritual placement of stone items (they had never been used) at the immediate entrance to the burial pit. The axes and wedges may have been deposited all at once upon burial, or at specific intervals, which indicates, as in the neighbouring burial pit 9, the existence of an axe cult. These types of items next to the deceased in a small burial pit may indicate his distinguished position in the tribe. This is further confirmed by the fact that only a single individual was buried in the pit-house. Otherwise, groups of the deceased were always buried together in Starčevo Culture graves. Based on the remaining holes for posts, it is apparent that there was a large canopy above this grave and a separately covered porch, which gave the grave a particularly ceremonial character. The question remains as to the burial of a faceless man. This kind of burial may have been prompted by the belief that his power over other tribe members is eliminated in this manner, assuming that he was a tribal leader or shaman. Several facts point to a possible connection between small burial pit 15 and residential pit-house 37: among others, their common dating to the most recent phase of settlement and their proximity to fence 7. Here it should be emphasized that among all residential and work pit-houses in the settlement, two wedges and remains of a polished axe were only found in pit-house 37. Additionally, one more wedge (axe?) fragment was found along fence 7, between pit-house 37 and burial pit 15. All this leads to the view that the family of the deceased buried in pit 15 lived in pit-house 37, and the deceased is assumed to have been a distinguished member of the tribe (perhaps its leader or shaman).

Results of charcoal sample measurements from the Starčevo Culture settlement at Zadubravlje have shown a time span of the structures in the researched section running from 6600 to 5300 cal BC (Fig. 5). The stylistic classification of the archaeological material from Zadubravlje and Slavonski Brod in the same Linear



Sl. 5 Raspodjela kalibriranih ¹⁴C starosti naselja u Slavonskom Brodu i Zadubravlju

Fig. 5 Distribution of calibrated radiocarbon ages of settlements in Slavonki Brod and Zadubravlje



Sl. 6 Raspodjela kalibriranih ¹⁴C starosti nalazišta starčevačkog kulturnog kompleksa

Fig. 6 Distribution of calibrated radiocarbon ages of the Starčevo Culture sites

6600 cal BC za bunar⁸ i za zemunice blizu 5800 cal BC, dok je za Slavonski Brod blizu 5900 cal BC (sl. 5).

Analize uzoraka ugljena metodom ¹⁴C iz horizonta Starčevo-Linear u Donjoj Branjevini, obavljene u Groningen-u i Oxfordu, datirale su objekte u raspon vremena od blizu 6100 do 5700 cal BC (Karmanski 2000, 186-188, grafikon 6; Whittle et al. 2002, 114, Fig. 4).

Prema raspodjeli kalibriranih ¹⁴C starosti nalazišta starčevačkog kulturnog kompleksa (Obelić et al. 1999, 4, T. 1; Krajcar Bronić et al. 2004, sl. 8), Zadubravlje i Slavonski Brod svojim datumima uvršteni su u sredinu vremenske tablice ranoneolitičkih nalazišta (sl. 6). Tom vremenu, približno od 6100 do 5200 cal BC, pripadala bi naselja Veluška Tumba, Mogila, Topolčani (mlađa faza) i Anzabegovo u Makedoniji; Grivac, Divostin, Banja, Padina, Lepenski Vir 2 i Odmut u Srbiji i Crnoj Gori; Obre 1 u Bosni; te Desk, Gyalaret, Hodmezövasarhely, Endröd, Szarvas, Battonya-Basaraga u Mađarskoj. Na području Hrvatske datiran je sloj impreso kulture iz Vele Špilje na Korčuli u Dalmaciji.

Novi radiokarbonski datumi ranoneolitičkih naselja u sjevernoj Srbiji i jugoistočnoj Mađarskoj, objavljeni 2002. godine, odredili su najstarija naselja u Šumadiji na oko 6200 BC, a u Banatu i Bačkoj oko 6000 BC (Whittle et al. 2002, 93).

Nova datiranja naselja starčevačke kulture metodom ¹⁴C u Hrvatskoj, donijele su višestruke znanstvene rezultate. Utvrdile su njihovu vremensku pripadnost unutar kronološkog slijeda ranoneolitičkih naselja starčevačkog kulturnog kompleksa i otkrila razvoj naselja Galovo u Slavonskom Brodu tijekom tri faze izgradnje. Arheološkim metodama nije se mogla utvrditi moguća vremenska razlika u izgradnji pojedinih nasebinskih cjelina, naročito u dijelu naselja gdje su objekti izgrađeni jedan pored drugog. Ovo još otežava i činjenica da inventar svih dosad otkrivenih objekata u naselju Galovo u Slavonskom Brodu pripada, po svojim stilskim obilježjima, samo jednom stupnju Linear A starčevačke kulture, koji je u ovim prostorima trajao dulje razdoblje. U ovakvom slučaju jedinu mogućnost otkrivanja vremenske razlike u izgradnji nasebinskih objekata mogu pružiti datiranja metodom ¹⁴C. Analize ovom metodom potvrdile su, ne samo vremensku razliku između donjih i gornjih objekata (prva i druga faza naselja), nego su još otkrile i treću fazu izgradnje naselja. Datiranje stambene zemunice 37 i grobne jame 15 u najmlađe izgrađene objekte u ovom dijelu naselja omogućilo je, po prvi put, znanstveno utemeljen prikaz horizontalne stratigrafije jednog od najstarijih ranoneolitičkih naselja kontinentalne Hrvatske.

A phase were confirmed by radiocarbon dating, so the sum of calibrated dates for Zadubravlje is close to 6600 cal BC for the well⁸ and close to 5800 cal BC for pit-houses, while for Slavonski Brod it is close to 5900 cal BC (Fig. 5).

Radiocarbon analysis of charcoal samples from the Starčevo-Linear horizon in Donja Branjevina, conducted in Groningen and Oxford, have dated the structures within a range from approximately 6100 to 5700 cal BC (Karmanski 2000, 186-188, chart 6; Whittle et al. 2002, 114, Fig. 4).

According to the distribution of calibrated radiocarbon ages of the Starčevo Culture sites (Obelić et al. 1999, 4, Pl. 1; Krajcar Bronić et al. 2004, Fig. 8), the dates obtained for Zadubravlje and Slavonski Brod have placed them in the middle of the Table of Early Neolithic sites (Fig. 6). This period, ranging from roughly 6100 to 5200 cal BC, would encompass the settlements Veluška Tumba, Mogila, Topolčani (later phase) and Anzabegovo in Macedonia; Grivac, Divostin, Banja, Padina, Lepenski Vir 2 and Odmut in Serbia and Montenegro; Obre 1 in Bosnia; and Desk, Gyalaret, Hodmezövasarhely, Endröd, Szarvas, Battonya-Basaraga in Hungary. In Croatia's territory, the stratum of Impreso Pottery Culture from Vela Špilja on the island of Korčula in Dalmatia was so dated.

New radiocarbon analyses of Early Neolithic settlements in northern Serbia and southeast Hungary, published in 2002, dated the oldest settlements in Šumadija to approximately 6200 BC, and those in Banat in Bačka to approximately 6000 BC (Whittle et al. 2002, 93).

The new radiocarbon dating of the Starčevo Culture settlements in Croatia has generated multiple scientific results. It has determined their chronological position within the range of Early Neolithic settlements of the Starčevo Culture complex and established that the development of the Galovo settlement in Slavonski Brod consisted of three construction phases. Archaeological methods could not ascertain possible chronological differences in the construction of individual settlement units, especially in those segments of the settlement where structures were built one next to the other. This is additionally exacerbated by the fact that the inventory of all thus far discovered structures in the Galovo settlement in Slavonski Brod, in terms of its style, belongs to only one Linear A phase of the Starčevo Culture, which lasted for an extended duration in this region. In such a case, only radiocarbon dating may offer the possibility of detecting chronological differences in the construction of settlement structures. This method of analysis has confirmed not only that there is a chronological difference between the lower and upper structures (first and second settlement phases), but also that there is a third phase of settlement construction. Dating of residential pit-house 37 and burial pit 15 to the most recently constructed part of the settlement has enabled for the first time a scientifically founded presentation of the horizontal stratigraphy of one of the oldest Early Neolithic settlements in continental Croatia.

8 Analize ugljena u Zadubravlju datirale su bunar u objekte starije od okolnih zemunica gotovo 500 godina. Ostaje otvoreno pitanje je li možda bunar pripadao starijem dijelu naselja koje nije istraženo.

8 Charcoal analysis in Zadubravlje has dated the well to structures older than the surrounding pit houses for almost 500 years. The question remains as to whether the well may belong to an older, as-yet unexplored part of the settlement.

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