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SUMAR
CONTENTS

Cuvânt înainte 5

Foreword 7

Laurens C. THISSEN
First ceramic assemblages in the Danube catchment, SE Europe – a synthesis of the radiocarbon evidence
Primele grupuri ceramice din bazinul Dunării, sud-estul Europei – o sinteză a datelor radiocarbon 9

Corneliu BELDIMAN, Diana-Maria SZTANCS
Industria materiilor dure animale aparţinând culturii Starčevo-Criş descoperită în aşezarea de la Măgura 'Buduiasca-Boldul lui Moş Ivănuş', jud. Teleorman. Consideraţii asupra repertoriului tipologic
L'industrie des matières dures animales appartenant à la culture Starčevo-Criş découverte dans le site Măgura 'Buduiasca-Boldul lui Moş Ivănuş', dép. de Teleorman, Roumanie. Considérations sur la typologie 31

Steve MILLS
High-resolution study and raster interpolation of early Neolithic pit features at Măgura 'Buduiasca', Teleorman County, Southern Romania
Studiu de înaltă rezoluţie şi interpolare raster asupra gropilor din epoca neolitică timpurie de la Măgura 'Buduiasca', judeţul Teleorman, sudul României 55

Amelia PANNETT
The lithic assemblages from Teleor 003: preliminary analysis and interpretations
Industria litică de la Teleor 003: studiu preliminar şi interpretări 67

Radian R. ANDREESCU, Pavel MIREA, Katia MOLDOVEANU, Ion TORCICĂ
Noi descoperiri în aşezarea gumelniţeană de la Vităneşti 'Măgurice'
New discoveries from the Gumelniţa culture settlement Vităneşti 'Măgurice' 75

Alin FRÎNCULEASA
Descoperiri arheobotanice în aşezarea eneolitică de la Mălăieştii de Jos (jud. Prahova)
Archaeobotanical discoveries from the Chalcolithic settlement of Mălăieştii de Jos (Prahova County) 93

Pavel MIREA
Un tezaur de epocă geto-dacă descoperit la Măgura, jud. Teleorman
A Geto-Dacian hoard find at Măgura, Teleorman County 99

Peti DONEVSKI
Archaeological investigations in Silistra (Durostorum)
Cercetări arheologice la Silistra (Durostorum) 105

Valentin RADU, Adrian BĂLĂŞESCU, Pavel MIREA, Steve MILLS, Katia MOLDOVEANU, Radian R. ANDREESCU, Douglass W. BAILEY
O depunere rituală de animale descoperită la Măgura 'Buduiasca' (jud. Teleorman)
A ritual animal deposition found at Măgura 'Buduiasca' (Teleorman County) 131

Bogdan CIUPERCĂ, Andrei MĂGUREANU
Unele observaţii asupra problemei tiparelor din secolele V-VII descoperite în spaţiul extra-carpatic
Regarding the problem of the VI-VII century mould finds in the extra-Carpathian area 149

Ecaterina ŢÂNŢĂREANU
Observaţii asupra ceramicii medievale de uz comun de la Zimnicea, jud. Teleorman
Notes on the common use medieval pottery from Zimnicea, Teleorman County 159

Douglass W. BAILEY
Archaeologies of the Teleorman Valley: the contemporary past and fragmented records
'Arheologiile' văii Teleormanului: trecutul contemporan şi înregistrările fragmentare 175

Cătălin LAZĂR
Consideraţii teoretico-metodologice privind studiul practicilor funerare (I):
Contribuţiile antropologiei culturale şi sociale
The theoretical and methodological considerations concerning the study of funerary practice (I):
the contribution of cultural and social anthropology 181

Ioana BOGDAN CĂTĂNICIU
Limes Daciae Inferioris, cercetări şi ipoteze
Limes Daciae Inferioris, research and hypotheses 195

Dragoş MĂNDESCU
Descoperirea sitului arheologic de la Zimnicea şi prima etapă a cercetării sale:
'Exploraţiunile' lui Cezar Bolliac (1845, 1858?, 1869, 1871-1873)
La découverte du site archéologique de Zimnicea et la première étape de sa recherche:
'Les explorations' de Cezar Bolliac (1845, 1858?, 1869, 1871-1873) 205

Ionel CÂNDEA
Vechi cercetări arheologice şi istorice în judeţul Teleorman şi la cetatea Turnu (Măgurele)
Old archaeological and historical research in Teleorman County and at Turnu (Măgurele)
Citadel 215

Colaboratori
Contributors 223

FIRST CERAMIC ASSEMBLAGES IN THE DANUBE CATCHMENT, SE EUROPE - A SYNTHESIS OF THE RADIOCARBON EVIDENCE

Laurens C. THISSEN

Abstract*: This paper reviews the available radiocarbon data from early pottery bearing sites in the Danube catchment in SE Europe. The dates suggest that the earliest use of pottery is to be set in the 61st century cal BC, with particularly convincing evidence from Divostin I, Magareći Mlin, Donja Branjevina and Lepenski Vir in Serbia. The contemporary dates from the site of Anza in Macedonia confirm there is no serious gap between the south to north as far as the introduction of pottery is concerned. It is further argued that the appearance of pottery in the Danube area must be seen as a largely local process of adoption and adaptation, while ultimately Anatolian know-how vis-à-vis pot making is not denied.*

Rezumat*: În acest articol se face o trecere în revistă a datelor radiocarbon disponibile, provenite din siturile neolitice timpurii din bazinul Dunării din sud-estul Europei. Datele sugerează că cea mai timpurie folosire a ceramicii poate fi stabilită în secolul 61 a. Chr., cu dovezi convingătoare, în mod deosebit, la Divostin I, Magareći Mlin, Donja Branjevina şi Lepenski Vir din Serbia. Datele contemporane provenite din situl de la Anza, din Macedonia, confirmă teoria că nu există un hiatus semnificativ între regiunile de nord şi de sud în ceea ce priveşte introducerea ceramicii. Este, de asemenea, argumentat faptul că apariţia ceramicii în zona Dunării trebuie văzută, în mare, ca un proces local de adoptare şi adaptare, în timp ce experienţa anatoliană vis-à-vis de producerea ceramicii nu poate fi negată.*

Keywords*: absolute chronology; Early Neolithic; Danube catchment; pottery; neolithisation.*

Cuvinte cheie*: cronologie absolută; Neolitic timpuriu; bazinul Dunării; ceramică; neolitizare.*

INTRODUCTION

Within the framework of the Danube catchment area of SE Europe, the current decade saw major contributions to absolute dating of the Mesolithic-Neolithic transition in N Serbia and SE Hungary (Whittle et al. 2002), Romania (Biagi et al. 2005) and the Iron Gates (Bonsall 2008, Borić and Miracle 2004). The issue of the appearance of the earliest pottery in the Danube region can now be approached with some confidence. Biagi et al., on the basis of new radiocarbon evidence, have established the earliest pottery bearing ('Pre-Criş') sites in Romania at about 6000 cal BC (Biagi et al. 2005: 43). They also pointed out the near contemporaneity of dates from other early ceramic sites, including Anza I, Padina, Donja Branjevina and the early Körös sites in SE Hungary (Biagi et al. 2005: 45). Equally, Bonsall has suggested that the Early Neolithic in the Iron Gates area set in at about 6000 cal BC (Bonsall 2008: 267ff.), noting a period of site invisibility preceding that boundary during the final centuries of the 7th millennium cal BC (Bonsall 2008: 264). In this paper, I will review the new datings pertaining to the appearance of pottery in these sites in some detail, starting with the Central Serbian data, moving north to the Vojvodina and SE Hungary, then dealing with the Iron Gates, and finishing with the early sites from Romania. A sequenced boundary model of the dates from Anza I, with which many of the northern sites are being compared culturally, will conclude this paper.[1]

There are various, isolated elements in the early pottery assemblages from the Danube catchment area which seem to refer to contemporary phenomena in, e.g., NW Anatolia, including the neatness of the *impresso* on otherwise well-burnished surfaces, the use of vertically pierced knobs and tubular lugs on globular pots, delicate snake-like appliqué on small pots, some of them squarish, as well as the use of small pottery lids. Rather than to treating these heterogeneous elements as proof of migration (as has been done lately by, for instance, Elenski 2004), I prefer to think that contemporaneity *cum* patterned similarity speaks rather for shared (but patterned) attitudes concerning use and manipulation and perhaps symbolic function of specific vessel categories, as well as for shared tactical and motor habit patterns leading to specific similar outcomes in specific instances. The issue to be investigated – and which needs a comprehensive, statistically reliable publication of the pertinent pottery assemblages from SE Europe and from this particular time frame (but cf. now Perić and Nikolić 2004, Vuković 2004, Bogdanović 2008) – is how shared bodies of knowledge concerning manufacture, use and manipulation of ceramic containers are transmitted in the first place - if we deny the inherently easy solution that is demic diffusion as the primary explanation for assemblage similarity across Anatolia and SE Europe during the critical time frame of the final 7th-early 6th mill. cal BC.

NW Anatolian pottery assemblages are in their totality, indeed, rather different compared to contemporary SE European ones at about 6000 cal BC. Additionally, from what we know about them at the moment, is that they already had a slowly evolving ‘conservative’ tradition of approximately 300–400 years behind them, with few technological and morphological changes, and a background of nearly a 1,000 years of pottery making if we link NW Anatolia up to the Konya area (Thissen 2007). NW Anatolian early pottery assemblages are characterised morphologically by deep oval bowls with S-shapes and simple flattened bases; and by globular holemouth pots provided with vertically pierced knob handles set in fours or with horizontal lugs set in twos. Technologically, dense, well-sorted mineral tempers are preferred in the early stages, to be replaced locally (as in Ilıpınar), albeit briefly by fibre tempers, keeping to the same form categories. Small, four-legged boxes with incised, white-filled sides complete the repertoire, which is marked by its structural clarity and by its technical sophistication. Surfaces are nearly always provided with thin, diluted clay slips applied both on the insides and outsides, well smoothed and burnished, while walling can be quite thin. Such pottery occurs on early sites along the east Marmara coast (Fikirtepe, Pendik), southwards in the Iznik–Yenişehir region (Ilıpınar, Menteşe and Barcin Höyük) and on the edge of the Anatolian plateau at Demircihüyük. Very recently, similar pottery has been found associated with burials near the site of Aktopraklık, west of Bursa (Necmi Karul, p.c., July 2007). Thus far, such sites are limited to the Turkish mainland, and they have not yet been attested in Turkish Thrace or the Gelibolu peninsula. The time frame is rather securely fixed in the 3rd quarter of the 7th millennium cal BC and the continuous sequence available at Ilıpınar proves that this kind of assemblage continued in use down to the beginning of the 6th millennium cal BC (Ilıpınar Phases X–IX). At present, these are among the earliest potteries known from NW Anatolia, and they are linked both to societies fully bent on farming and also to one-period sites which may have had a mixed economy of farming and fishing, as is the case for the Marmara sites. On the basis of the animal remains, Buitenhuis has posited - in the case of basal Ilıpınar - that people originally had moved from the south where the sheep/goat dominated subsistence was more at home (Buitenhuis 1995: 153). Importantly, however, in the site of Menteşe, dating a few centuries prior to Ilıpınar, cattle was the dominant domestic species attested in the faunal material, but ovicaprids superseded this in the later Neolithic deposits and compare more favourably with the situation at Ilıpınar X (Gourichon & Helmer 2008: 441f., 447 Fig. 5). I have argued elsewhere that the NW Anatolian Neolithic may have its origins in the Konya area as far as pottery technology and morphology is concerned (Thissen 1999). In Çatalhöyük we find a similar division among pots and associated handle sets, while also here mineral tempers and rather thin walled vessels are the norm (superseding, at about Phase VII/VI a thicker walled, fibre tempered assemblage). At present, only at Ilıpınar this pottery tradition can be followed down into the Early Chalcolithic 6th mill., and with continuous adjustments and modifications exists up to and including Phase VI, dating to the 57th century BC.

The earliest ceramic assemblages from the Danube catchment area, as now published from Blagotin, Lepenski Vir and Grivac, differ in important aspects from these NW Anatolian potteries, and foremost in their categorical structure, as well as in essential details signifying differences in manipulation and positioning of the vessels. NW Anatolian features such as flat bases and two differing handle sets do not occur in the Danube sites, nor are the large dishes with roughened exteriors, so typical for the SE European sites, part of the Anatolian repertoire (see further below, discussion of Lepenski Vir data).

Thus, if ceramic knowledge has been transmitted from NW Anatolian communities and shared with SE European Mesolithic ones, it will have been foremost procedural know-how and operational chains related to raw material sourcing, to manufacture methods including tempering and treatment of surfaces, and firing procedures. Firmly embedded concepts regarding use and manipulation in NW Anatolian dealings with ceramic containers will have been adapted and transformed by SE European societies.

Consequently, rather than to trace firm arrows on the map symbolising movement and penetration, my premise vis-à-vis the origins of the early ceramics in SE Europe is that innovations and new technologies will have been embedded in existing ones. This would imply on the new products’ producers an awareness of the gestures and social implications of older technologies, in their turn determining and negotiating the development of the new products, their use and their manipulation. A second premise of my view on the adoption of pottery within late 7th mill. societies in SE Europe would be that – given emerging consensus that only a small amount of Near Eastern stock contributed to the European gene pool (Richards 2003) - the indigenous role in adoption of innovations and historical transformations in SE Europe was considerable and dominant (cf. Budja

2005). Consequently, the local population will have been the determining factor in allowing the adoption of new technologies and opening the way to new subsistence strategies. This implies that the Mesolithic of the 7th millennium cal BC was a time of openness towards the new, and people were willing to face the consequences of major shifts in their ways of life. I believe, therefore, a priori that the adoption of pottery and the Neolithic way of life was not the result of intrusive agricultural communities, but a largely local process. Chapman has hypothesized "open, overlapping mating networks" in the Danube catchment of SE Europe during the Mesolithic to explain "artefactual and architectural complexity" (Chapman 1989: 512), but, more relevant, he also pointed out that such networks would "allow the exchange of goods and information", which he sees confirmed by coherence in material culture and architecture in the Iron Gates (Chapman 1989: 507). The good thing about the Iron Gates model is that it can serve as a guide fossil for interpreting Meso-Neo life patterns outside the gorges, that is, in the plains. And I don't see why there should be much difference between the two areas apart from local determinations and exigencies of place and feeling. Deep time will have been at play as much on the Wallachian plains as it may have been around Lepenski Vir.[2] The wrong thing of the arrows is both that they deny, or rather ignore the existence of local populations and that they reduce human inventiveness and local *savoir-faire* to irrelevant and obnoxious behaviour. Jean Perrot's *fixation au sol* (Perrot 2000: 18) as much relates to hunter-gatherers with their expert knowledge of the terrain, as it does – seemingly more naturally – to settled communities.

This is not to deny, however, that expert procedural knowledge about the manufacture of pottery will possibly have come from external, ultimately Anatolian sources, and the assumed dynamism and flexibility of Mesolithic SE European society sustained and generated by (assumed) exchange networks for mating may have extended to the coastal regions of the Aegean and Black Sea as the most likely 'contact zones' for interregional exchange and transmission of knowledge.

CENTRAL SERBIA (MORAVA AREA)

Divostin I

Several dates from Divostin I have been combined prior to calibration since stemming from the same sample.[3] The excavators doubt that the radiocarbon samples from Divostin I "represent more than a single time event. Thus they also do not support the hypothesis of a long Divostin I occupation with several subphases" (McPherron, Bucha and Aitken 1988: 381). Given this assumption, a combination (COMBINE) of the posterior probability distributions of all dates from Divostin I (*n*=5) is warranted, and yields an age range set between 5990–5900 cal BC at 1σ (Figure 1). The dates agree well internally, apart from the combined date BM–573+Bln–896, which has poor agreement at 55.5% (being below the threshold of 60.0%). Summing the Divostin I dates (*n*=5) yields the obviously less constrained range of 6030–5800 cal BC at 1σ. This result conforms fully to the single date from Banja (6030–5810 cal BC).

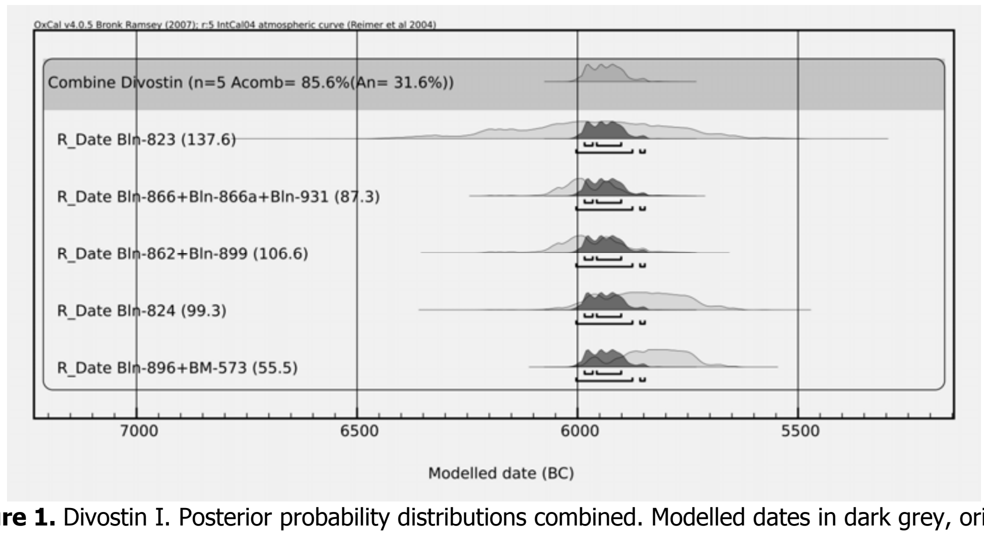

Figure 1. Divostin I. Posterior probability distributions combined. Modelled dates in dark grey, original individually calibrated dates light grey.
Divostin I. Suma probabilităţilor datelor radiocarbon combinate. În gri închis sunt ilustrate datele modelate, în gri deschis datele originale, calibrate individual.

Blagotin-Poljna

Blagotin, near the city of Trstenik, has three dates on animal and human bone, falling in two mutually exclusive groups: an earlier date ranging between 6430–6260 cal BC, and two later, rather similar dates set between 6220–6020 cal BC, thus being rather older than the age reached for Divostin I.

The associated material culture from pit dwelling 7 and ZM 7, from which these dates derive, is not known or published. However, Vuković has recently published the Starčevo ceramics from structure 03 from Blagotin, and compares it with the Proto-Starčevo pottery from, among others, Grivac, Divostin, Donja Branjevina and Lepenski Vir, while also relating it to Anza and Thessaly (Vuković 2004: 111). Distinguishing criterion for correlation is basically the proportion of surface-roughened and plain burnished ceramics, which is very high for the latter at Blagotin. Vuković dates Blagotin structure 03 provisionally to "the very end of Proto-Starčevo II" (Srejović scheme), or to "the end of the Linear A stage" (Dimitrijević scheme) (Vuković 2004: 116). Considering these parallels, the available radiocarbon dates appear slightly too old, and would suggest different chronological events having occurred at the site. Incidentally, the range of the later two dates conforms fully to the single date available from Grivac-Barice, 6220–6030 cal BC.

VOJVODINA

Donja Branjevina

Looking solely at the radiocarbon evidence, two date clusters are nearly mutually exclusive: an earlier one comprising GrN–15974, 15976 and OxA–8557, summing at 6070–5910 cal BC at 1σ, and a later one with GrN–24609, OxA–8555 and 8556, summing at 5750–5630 cal BC at 1σ. The remaining date GrN–15975 falls exactly in between these clusters with a range of 5900-5760 cal BC. One of the late dates (GrN–24609) stems from Karmanski's 'white-painted phase', but would conform better to the Starčevo–Criş–Körös phase overlying the older deposit at the site. White-paint decorated vessels are not restricted to the earliest pottery assemblages, however, and do, for instance, occur in the Starčevo–Criş stage as is attested at Teleor 003/Măgura, which is radiocarbon dated to the 58th century cal BC (Bailey et al., *in press*; Thissen 2008; see also *infra* the Hungarian evidence). The intermediate date derives from the earliest, 'monochrome' stage and would be too young as well for the phase it is allegedly dating. Apart from this intermediate date, two distinct radiocarbon-dated stages are present at the site, suggesting a gap of a century and a half in between the earliest pottery occupation and the Starčevo–Criş–Körös habitation. The evidence does not provide clear proof of a distinct 'white-painted' horizon. Given the differing provenance of the three early dates, I am hesitant to apply the COMBINE method to them. If done, however, agreement is very good at 128.2%, yielding a range between 6030–5980 cal BC at 1s, which would make basal Donja Branjevina earlier than Divostin I.

Sequencing the data gives very poor agreement for GrN–24609 and OxA–8557, and these samples are likely not to derive from the phases attributed to them (Figure 2). The sequencing does not confirm that the three dated phases are indeed representing consecutive intervals in time. In fact, the Phase II date and the younger Phase Ib dates correlate rather well, whereas the Phase Ib older date conforms better with the Phase III cluster. Complicating matters further is that the oldest and the youngest sample from Ib have the same provenance, viz. trench II under house, D corner.

Magareći Mlin

The site, north of Donja Branjevina, has two dates from a house, which on this basis may be combined using the COMBINE function. This yields a range between 6000–5900 cal BC at 1σ, with an agreement index of 79.3%. This result conforms fully to the combined age arrived at for Divostin I. A third date (GrN–15971) derives from a pit in the same house, but is mutually exclusive on the 1σ level and also later, suggesting it stems from a later event.

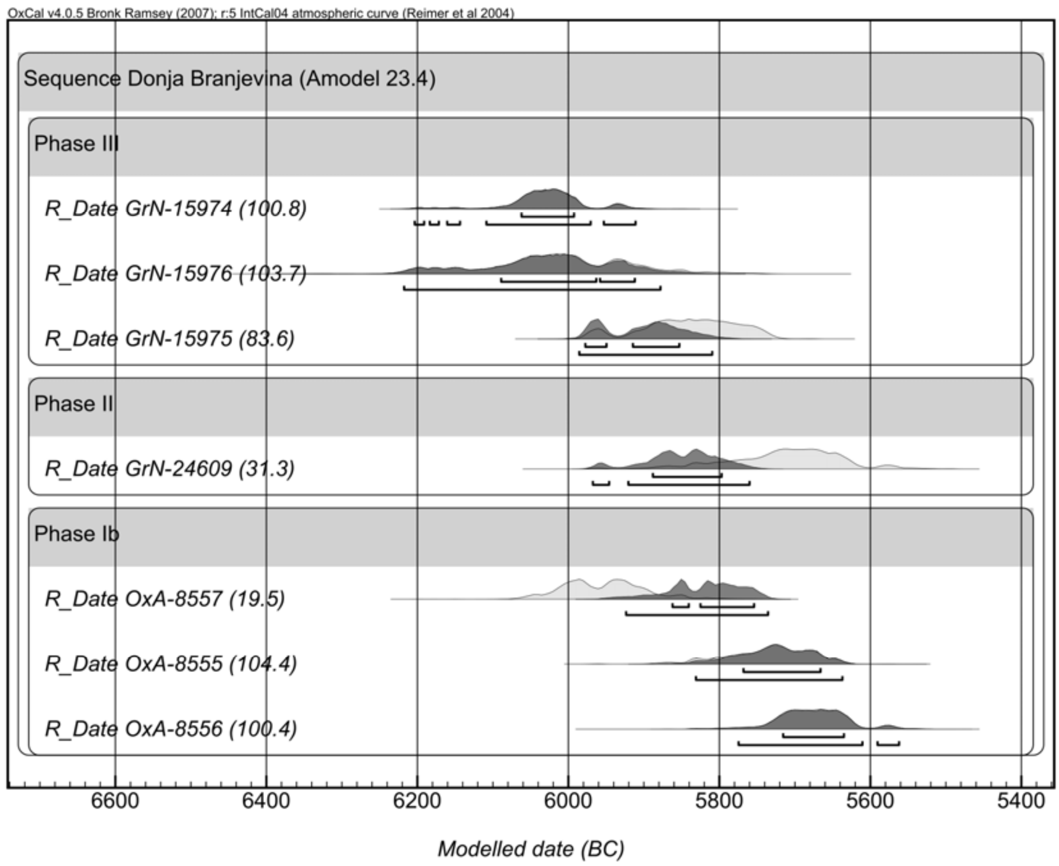

Figure 2. Donja Branjevina, sequenced radiocarbon dates following the phasing of the site. Modelled dates in dark grey, original, individually calibrated dates light grey.
Donja Branjevina, datele radiocarbon secvenţiale, prezentate pe faze. În gri închis sunt ilustrate datele modelate, în gri deschis datele originale, calibrate individual.

HUNGARY

Pitvaros

Pitvaros pit 3/B dating between 6000–5900 cal BC makes this the earliest site of SE Hungary at present, with a date fully agreeing with Divostin I and Magarećí Mlin. Unfortunately, the material remains unpublished (cf. Whittle et al. 2002: 73).

Szarvas 23 and Endrőd 119

These sites seem to yield similar pottery assemblages, and are compared to the Thessalian Early Neolithic and Anza I on the basis of the occurrence of a handful of white-painted sherds, as well as with Gura Baciului and Donja Branjevina (Makkay 1984: 24, 26; 1992: 127; 1996, Pl. 9: 5–7). Two dates from Szarvas 23 range between 5790–5560 cal BC. A younger Szarvas date is between 5550–5210 cal BC. A good series of ^{14}C dates from Endrőd 119 points to a similar age of this site as Szarvas 23, with the dates summing at 5780–5640 cal BC (1σ) (Figure 3). The dates from the similar site of Ecsegfalva 23 sum at 5840–5650 cal BC 1σ, while those from Endrőd-Szujókereszt 39 sum at 5980–5950 (5.3%), 5920–5720 (62.9%).

The Hungarian radiocarbon evidence thus suggests that sites existed as early as the 6th millennium cal BC (Pitvaros) and occupation shifted to other sites in the same general region during the 59th (Endrőd 39) and 58th centuries cal BC (Ecsegfalva 23, Szarvas 23 and Endrőd 119).

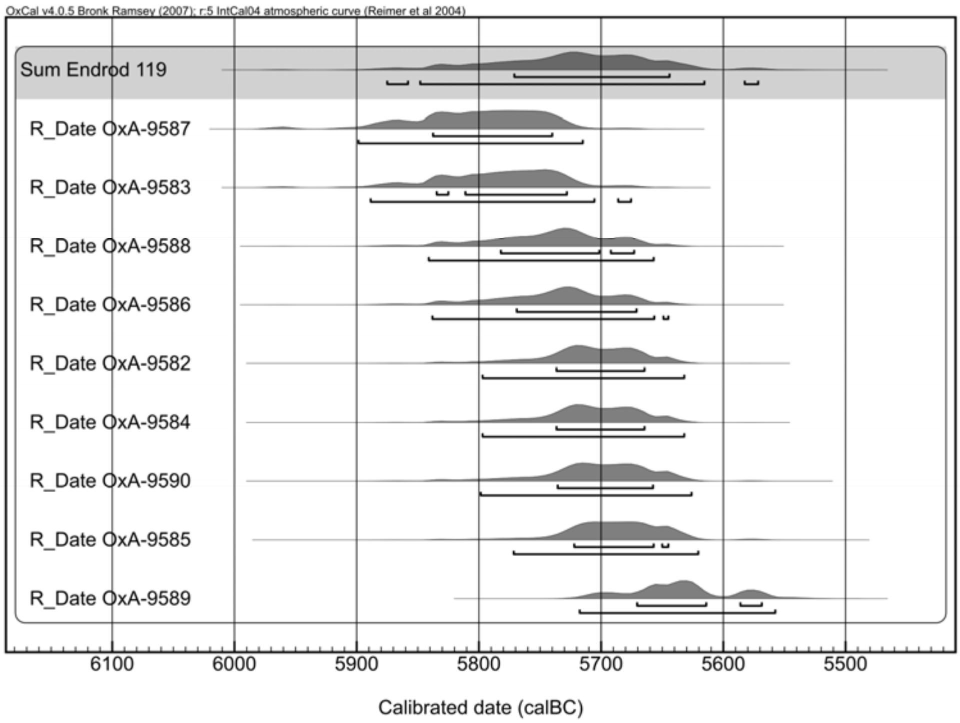

Figure 3. Summed posterior probability distributions of the Endrőd 119 dates.
Suma probabilităţilor datelor radiocarbon de la Endrőd 119.

IRON GATES

Lepenski Vir

The revived interest in the Iron Gates Mesolithic has brought a wealth of new evidence and interpretative detail to the Mesolithic–Early Neolithic transition especially for Lepenski Vir. There are now seven structures which have ^{14}C and pottery associated (Table 1).[4] As with all Lepenski Vir dates, there is room for doubt as to the reliability of context for the samples, and it should be born in mind that contextual assemblages are still unpublished, as is also cautioned by Garašanin and Radovanović (2001: 124).

Table 1. Lepenski Vir. Radiocarbon dated structures with pottery.
Lepenski Vir. Datele radiocarbon provenite din structurile cu ceramică.

Provenance	Cal BC 1sigma	OxCal function	Sample material	
House 36	6250-6082 (66.8%)	R_COMBINE	Timber beam (*Quercus*)	Charcoal
House 54	6060-5980	COMBINE		Charcoal (ash)
House 47	5970-5955 (6.1%) 5909-5777 (62.1%)		Nd	Charcoal
House 1	5844-5658		Quercus	Charcoal
House 16	5807-5629		Quercus	Charcoal
House 37	5806-5672	R_COMBINE	Quercus (timber beam)	Charcoal
House 32	5748-5636		Nd	Charcoal

Cook et al. suggest that the material from House 54 is from 'old wood' and hence the data maybe a few centuries too old (Cook et al. 2001: 454, 459), but no sample specifics are available for the four combined dates from House 54 (Z–143, KN–407, Bln–738 and Z–115).[5] Although this might be the case, the evidence from the *Quercus* samples from House 1, 16, 37 and 32 rather fits a Starčevo-Criş-Körös periodisation, while also *Quercus* samples from houses without pottery (Houses 9, IX and XXXII) do suit that range or are considerably younger even, as is the case of the latter two houses (Figure 4). Also the *Ulmus* sample (allegedly old wood as well) from House 51 (no pottery) makes the structure rather young (5630–5480 cal BC at 1σ). It is not clear that these samples do in fact stem from old wood. On the other hand, the oak timber beam samples combining into the early House 36 date, might suffer from the old wood problem, and suggest that indeed old wood had been used in the construction of this particular building, but then again the timber dates from house 37 seem perfectly agreeable.

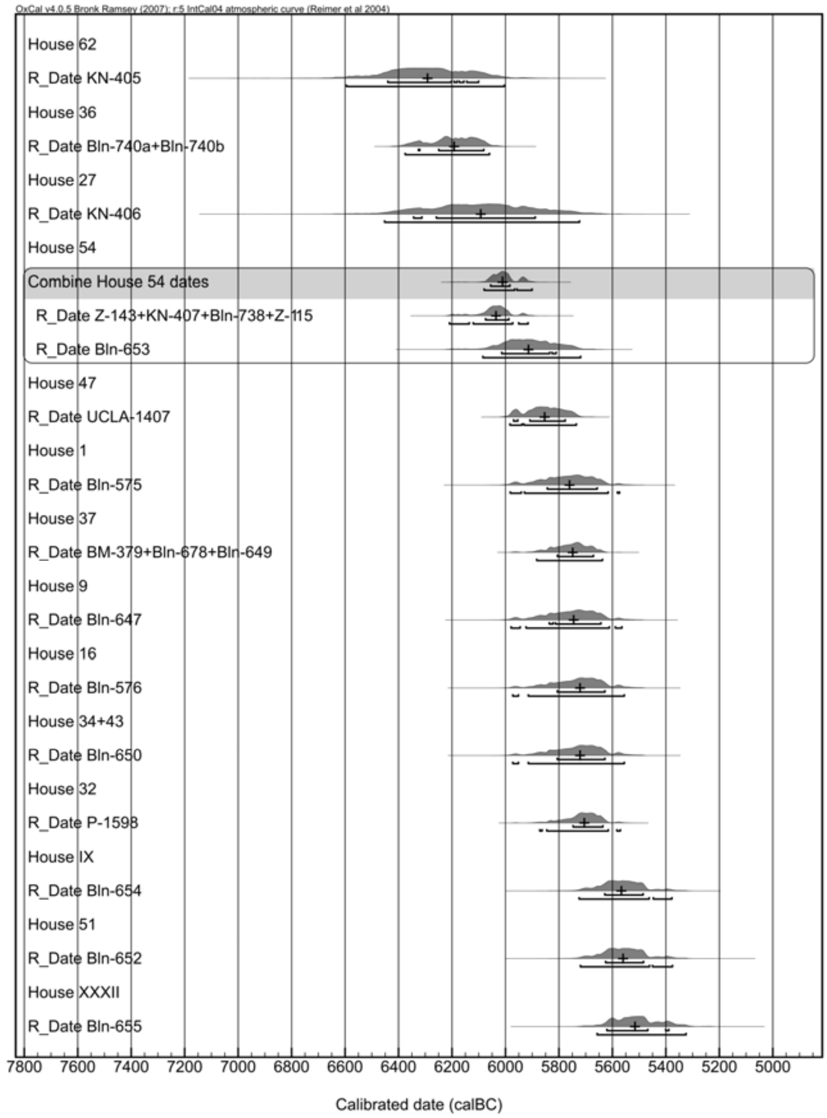

Figure 4. Lepenski Vir. Radiocarbon data from house contexts in chronological order, calibrated individually, with median indicated.
Lepenski Vir. Datele radiocarbon provenite din locuinţe, în ordine cronologică, calibrate individual, cu valoarea medie indicată.

As evidence now stands, House 36 might be dated too old on the basis of its samples possibly deriving from old wood, but its age does conform to the Blagotin and Grivac determinations.

The two dates from House 54 may be combined using COMBINE in order to decrease the error margins. Both results agree for 92.2% and yield a combined range of 6060–5980 cal BC at 1σ, which is rather similar to the age reached for the basal Donja Branjevina phase. Given this congruence, an early date for House 54 is perfectly acceptable, and would not need to suffer from the old wood issue. However, as the datings demonstrate, presence or absence of pottery in the houses is no indication of their age, and in itself this argument cannot be used in the Mesolithic vs. Neolithic issue at play in Lepenski Vir. The dating evidence for structure 47 shows a two-peaked result but with a 62.1% distribution between 5910–5770 cal BC, suggesting a 59th century date for this house. Houses 1, 16, 37 and 32 do seem to represent a younger stage in house building, dating between 5840-5630 cal BC. Houses 9 and 34+43, being without pottery, fully conform to this time span.

All in all, the data for houses with pottery at Lepenski Vir show a fleeting sequence with partly overlapping ages, hinting at the existence of a continuous occupation starting most likely in the 61st C at the earliest (not including the data from Houses 27, 62 with huge errors of 160 and 200, nor the House 36 date on timber) and ending during the 57th C cal BC. In addition to this, if we can trust[6] the data from Houses 51, IX and XXXII, trapezoid house building in Lepenski Vir went on into mid-6th millennium cal BC times. These houses were without pottery.

This continuous sequence is confirmed but, importantly, also expanded by the AMS ^{14}C dates acquired on human bone from a series of burials from Lepenski Vir. As much as 17 dates yield a smooth sequence between 6380–5550 cal BC (Bonsall et al. 2004: 296; Bonsall 2008; Bonsall et al., *in press*). Four of these dates straddle the critical 7th–6th millennium cal BC transition (at 1σ), and four others date to the first half of the 6th millennium cal BC. Importantly, these ages acquired from the burials correlate rather well with the ages from the houses and they do overlap with the dates from the earliest three Houses 62, 36 and 27. In this way, the argument of 'old wood' (in the case of House 36) may not be relevant, and would suggest this date is rather to be trusted, and the timber from which the samples derived would have been rather young wood. Consequently, the oldest pottery from Lepenski Vir might be that from House 36, and datable between 6250–6080 cal BC (66.8%).

Perić and Nikolić argue that the ceramics dug during the first, 1965, season stems from pits *above* houses 5 and 6 in trenches II, IIa and III and that there is no relation between the two events: "[…] the pits cut for Neolithic pit-dwellings and cuts for floors of Mesolithic house bases were made at the different levels and […] they were separated by a certain stratigraphic obstruction resulting from chronological discontinuity" (Perić and Nikolić 2004: 180). Unfortunately, houses 5 and 6 are without absolute dates, but apparently no pottery was associated to them.

The view still is that pottery in the early Iron Gates contexts appears as prestige items "or as containers for plant foods, which were the real items for barter" (Budja 1999: 134) – pottery thus implied to be of symbolic or secondary use, and also implied to be foreign to the local context, and hence scarce like in Vitelli's hypothesis on early Franchthi ceramics. However, Borić has pointed out that pottery in Padina occurs in quantities not differing from surrounding contemporary sites, and proposed the pattern at Lepenski Vir was not very different (Borić 1999: 49f., 52; 2002: 1037f.), a fact which would preclude import and would favour local manufacture. On these grounds, pottery may not have been 'introduced selectively' in the Iron Gates area as Budja put it (1999: 136), but was produced locally on a large scale. This is indeed the emerging picture from other contemporary sites where pottery occurs in great quantity (and, importantly, also in great categorical diversity) from the outset (as, e.g., at the Pre-Criş site of Măgura in S Romania, Pavel Mirea, p.c.). Indeed, pottery in the Danube catchment does seem to be related in changing food habit patterns and dietary adaptations, and I agree with Budja's conclusion (1999: 136) opting for this correlation. Importantly, nearly all early Danubian pottery was tempered with vegetal fibres, and Szakmány and Starnini have conclusively shown that the elongated pores left by these fibres mostly stem from chaff "resulting from crop (cereals)-processing" (Szakmány and Starnini 2007: 14).

With the recent publication by Perić and Nikolić a good overview of Lepenski Vir pottery is now available, characterised by everted dishes and plates with finger impressed rim tops, S-profile deep bowls and cups, slightly collared holemouth pots, globular pots with S-shaped necks, as well as some possibly larger storage like vessels (Perić and Nikolić 2004, Plate XI:10–11). Characteristic are fenestrated bases of square plan suggesting the large square dishes well known from Lepenski Vir and Donja Branjevina. Vertically pierced knob handles (Perić and Nikolić 2004, Plate XVIII:1–7) occur, but are not quantified (Perić and Nikolić 2004: 188), as well as neat *impresso* by single direction nail or pinched. Typical are very large platters or dishes with rim diameters of 60 cm (Perić and Nikolić 2004: 187, Plate X), with pared down exterior and burnished/slipped interior sides. Bases are usually flat or are ring bases. The sample discussed is argued to derive from pits from the LV III settlement, but they recognise that the pottery "appears to be rather archaic" (Perić and Nikolić 2004: 191), basically because of the absence of painted wares and the "small number of forms", and they would date it neither as earliest Starčevo, nor as proto-Starčevo. At the same time, Perić and Nikolić argue convincingly that there existed only one single LV III horizon in contrast to the two distinguished by Srejović (IIIa and IIIb – Perić and Nikolić 2004: 180). In other words: the pottery published now, while limited to two areas dug in 1965 and 1966, must be seen as representative of the earliest pottery bearing levels from the site. The material studied is stated to derive from pits *overlying* houses 5 and 6 and also – approximately – the area occupied by houses 3 to the west (Perić and Nikolić 2004: 162). None of these are ^{14}C dated, but house 1, just SW of house 3 is dated 5850–5660 cal BC. Perić and Nikolić (2004: 173) argue that we have two levels in trench II: oldest: House 5, second:

"another structure of a pit-dwelling type". It is from the latter one, they say, that the pottery derives, i.e., the pottery is *not* associated with the trapezoid houses. Their view is in fact fully consistent with Srejović's first interpretations of the Lepenski Vir sequence (cf. Srejović 1966, 1967). This argument does not account for Garašanin's and Radovanović's recent pictorial proof of Houses 4 and 54 carrying pottery on the floors (Garašanin & Radovanović 2001: 119 Fig. 1, 120 Fig. 4), nor does it account for the clear association of pottery and trapezoid houses at Padina and Vlasac. Borić has even gone as far as to disprove the very existence of a LV III horizon overlying the houses (Borić 1999: 51f.) and furthermore found good proof for conflating LV I and II (Borić 2002: 1035). Importantly, Garašanin and Radovanović point out that the pottery found on the floors of the Mesolithic houses and "the bulk of the LV IIIa [=Early Neolithic] pottery from pits [...] is in fact one and the same, i.e., LV I pottery" (Garašanin and Radovanović 2001: 123). These authors compare this early Lepenski Vir pottery with Anza I and characterise it as 'Starčevo I' (Garašanin and Radovanović 2001: 122 Table 2). Consequently, the material studied and presented by Perić and Nikolić is very likely part of that same LV IIIa 'bulk', and would thus also be datable to a time frame ideally indicated by House 54, that is, 6060–5980 cal BC. Such a time span would not be in contradiction with the strong parallels the Lepenski Vir pottery as published now has with, e.g., Ocna Sibiului and Şeuşa in Transylvania (cf. Ciută 2005), as well as with Donja Branjevina, but also with Blagotin.

Padina

House 9 dates (and perhaps those from House 12, although the sample derives from "above House 12" (Whittle et al. 2002: 113) cluster around a mid-7th millennium cal BC age at 1σ. Two burials, represented by three dates, also belong to this time span (Burials 1a and 2, all in Sector I), as well as a date deriving from *under* the floor of House 18, and which is much earlier than the same house sample from *on the floor* (

Figure 6).

A subsequent cluster of three dates from Sector III but without precise context (but one sample derives from an unspecified house floor) falls in the critical period of our concern, between 6060–5830 cal BC (GrN–8230, GrN–7981 and GrN–?). No burials are found from this same general time span.

A latest cluster of two dates ranges between 5610–5480 cal BC, and one of them stems from an unspecified house (GrN–8229), indicating that even toward the 55th century cal BC trapezoidal houses continued to be built in the Iron Gates.

In between all clusters single dates fill in the gaps, and their dates all stem from houses as well, confirming a continuity starting with the mid-7th - mid 6th millennium cal BC. In contrast to Bonsall (2008), who argues only at Lepenski Vir the gap between 6300–6000 cal BC is bridged, the date on a bone artefact from House 17 (OxA–11103) attests continuity in the final 7th millennium cal BC also at Padina, although it must be noted that no dated burials exist after the 6460–6260 cal BC range suggested by the youngest burial 1a (OxA–11107).

According to Borić (1999: 48), the following houses at Padina were associated with pottery: Houses 7, 15 (OxA–9054: 5730–5640 cal BC) and 18 (OxA–9052: 5970–5760 cal BC). Houses 15 and 18 are mutually exclusive in age and would yield potentially differing pottery assemblages. Also House 13 has pottery (Jovanović 1987: 12 Fig.12), as well as House 12 (Jovanović 1969: 30; Garašanin and Radovanović 2001: 120), and House 17 (Budja 2006: 193 Fig. 7). In fact, Jovanović (1968: 5) states that pottery was found "with varying intensity *in all these building horizons of sector III*", (my emphasis), where of course this was in the beginning of the excavation. And not all houses were yet recovered, but the three building horizons already identified.

Houses 5 and 7 'fishbone horizon' from abandonment stage of these structures contained pottery (monochrome dishes) (Jovanović 1969:30). House 12 was "partly filled up by a layer of small fish and animal bones besides ceramic fragments" (Jovanović 1969: 30). From the floors of Houses 15, 17 and 18 came more fragmented vessels, and from House 15 a kind of storage vessel ('pithos'), a globular *impresso* pot and 'rough dishes' are attested (Jovanović 1969: 30)

In contrast to Budja's recent arguments concerning a symbolic use of pottery in House 18, conflating the ceramic inventory to five vessels "too small and too unusual for routine domestic activities" (Budja 2006: 192), Jovanović stresses that as much as 10–12 vessels were associated with the structure, and they are of varying form and function, including a couple of thick walled vessels near an ash place, similar sherds of which were also found in a secluded area east of this ashy spot (Jovanović 1987: 8ff).

It should be noted that the fact that House 9 is early, contradicts the summary scheme presented by Jovanović (1987: 3 Fig. 3) where Houses 5–11 would belong to Padina B1 (the oldest row of houses. In fact, no such linear patterning is visible from the ^{14}C dates, where, for instance, adjacent houses 15, 17 and 18 all have mutually exclusive ages at the 1σ level.

While Jovanović explains the inadequacy of the Padina ^{14}C dates out of the site sequencing, with three building periods in three rows each one a bit higher on the slope and younger, where debris material from the upper horizons caused the lower slope horizon to be contaminated (Jovanović 1987: 12, 16), this potential disturbance is not apparent from the ^{14}C dates themselves. Two houses from horizon 2 and 1 (9 and 12) date to the mid-7th millennium cal BC and do not suffer from flow-down from above. Also House 15 from the middle horizon has a mid 6th mill date from a sample below the floor, and it seems unlikely the sample derives from the upper/younger slope area. The sample's position would even make House 15 younger than that and possibly contemporary with the two mid-6th millennium cal BC dates available from sector III. Complicating factor is that Houses 13 and 7 are said to carry pottery, but a mid-7th mill. date for this would appear much too old. Thee are two options for explanation: either the two dates from horizons 1 and 2 are from contexts with weak contextual reliability, or else the arrangement in chronological superimposed rows is not real, and in fact both options might apply. The pottery in houses 13 and 7 contradicts their assumed mid 7th millennium cal BC date, but simultaneously a mid 7th mill. occupation has existed at Padina sector B as proven by the dates themselves and two burials as well, in sector I (burials 1a and 2). The matter cannot be decided with further publication of the evidence, but one of the possible implications is that – if we take the presence of pottery as criterion - the trapezoid houses in sector B all might date to the 6th millennium cal BC only. The Lepenski Vir evidence has however three houses dating prior to 6000 cal BC, but remarkably, two of them from the latest centuries of the 7th millennium cal BC, suggesting the trapezoid form is related to the Meso-Neo interface (Houses 62, 36 and 27), and indeed Jovanović has repeatedly pointed out the association of these houses with pottery (Jovanović 1968, 1969, 1987; also Borić 1999, 49). Do we now come full circle and now plead that the allegedly Mesolithic houses in the Iron Gates are in fact Early Neolithic? The data analysis seems to suggest so.

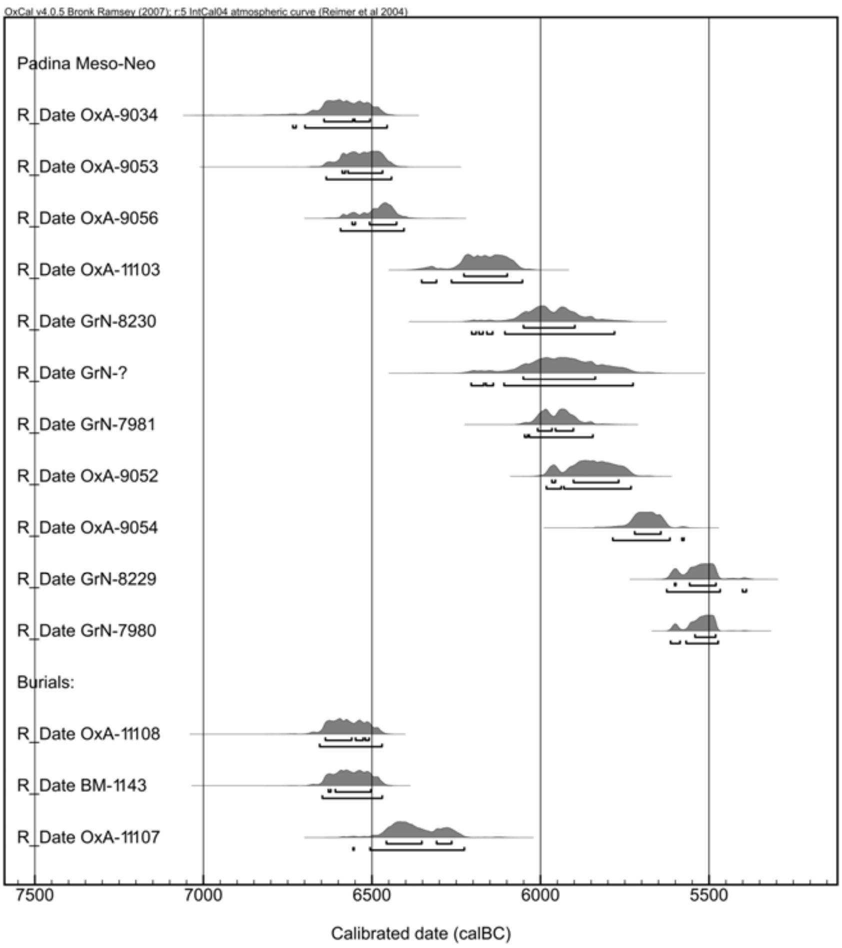

Figure 5. Padina radiocarbon evidence from the 7th millennium al BC onward, calibrated individually.
Padina. Datele radiocarbon din mileniul 7 a. Chr., calibrate individual.

Schela Cladovei

Nine dates, all on bone artefacts, spread out nicely over the first half of the 6th mill. cal BC, with, as Bonsall pointed out, a remarkable gap between an Epi-Palaeolithic and an Early–Late Mesolithic cluster of earlier dates with 6250 as the younger extreme, and the Neolithic cluster starting at 6030 cal BC (Bonsall 2008; Bonsall et al., *in press*).

Vlasac

Irrespective of the stratigraphic order, six dates cluster in the first half of the 6th mill. cal BC (at 1σ), *viz*. Z–262, Bln–1051, Bln–1053, Bln–1014, Bln–1051a, and Z–268. Apart from Z–268, which is from burial 11 (but possibly contaminated by later material, since sample is from grave fill), all dates stem from Vlasac Ib, houses 1 and 2 and these may thus be combined assuming them to be stemming from a single event or a small series of consecutive events. When combining the three house-1 dates and the two house 2 dates (COMBINE), they indicate slightly overlapping ranges between 5850–5730 cal BC (1σ) for house 1 and 5780–5640 cal BC for House 2 with good agreements (

Figure 6). No burials are dated from that same time span, but two burials point to a slightly later time around the middle of the 6th millennium cal BC.

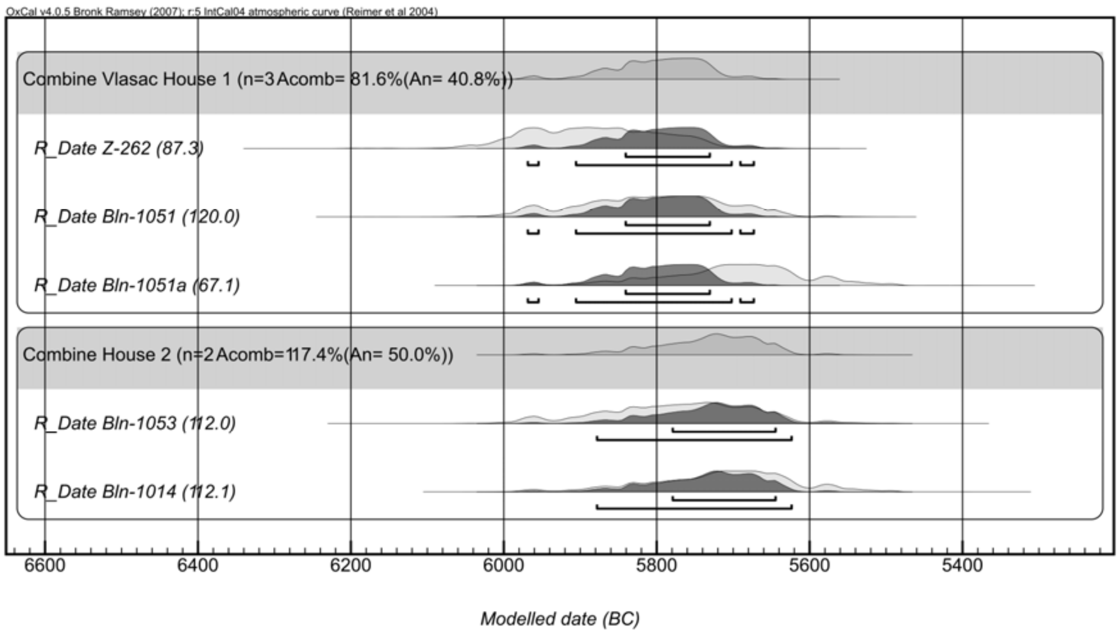

Figure 6. Vlasac. Posterior probability distributions for House 1 and 2 combined. Modelled dates in dark grey, original individually calibrated dates light grey.
Vlasac. Suma probabilităţilor datelor radiocarbon combinate, pentru locuinţele 1 şi 2 . În gri închis sunt ilustrate datele modelate, în gri deschis datele originale, calibrate individual.

Earlier dates range between 7000 and 6200 cal BC, with some very early dates as well beyond that range. There are no dates between 6250 and 5990 cal BC (1σ) (Bonsall 2008: 264, 266 Fig. 10.6).

ROMANIA

The Romanian evidence for early pottery is still scarce (

Figure 7). Miercurea Sibiului and Ocna Sibiului, two sites in the same general area, each yield an age straddling the 7th–6th millennium transition. Miercurea has an early age between 6010–5840, Ocna between 6060–5920 cal BC at 1σ, both from Pre-Criş contexts. Both sites therefore fall roughly within the same summed age as, for instance, Divostin I and Banja. Also the dates from Gura

Baciului, Şeuşa and Foeni-Sălaş agree with this time span, where the latter site has two mutually exclusive dates from similar contexts, one between 6450–6260, the other between 6020–5900 cal BC.

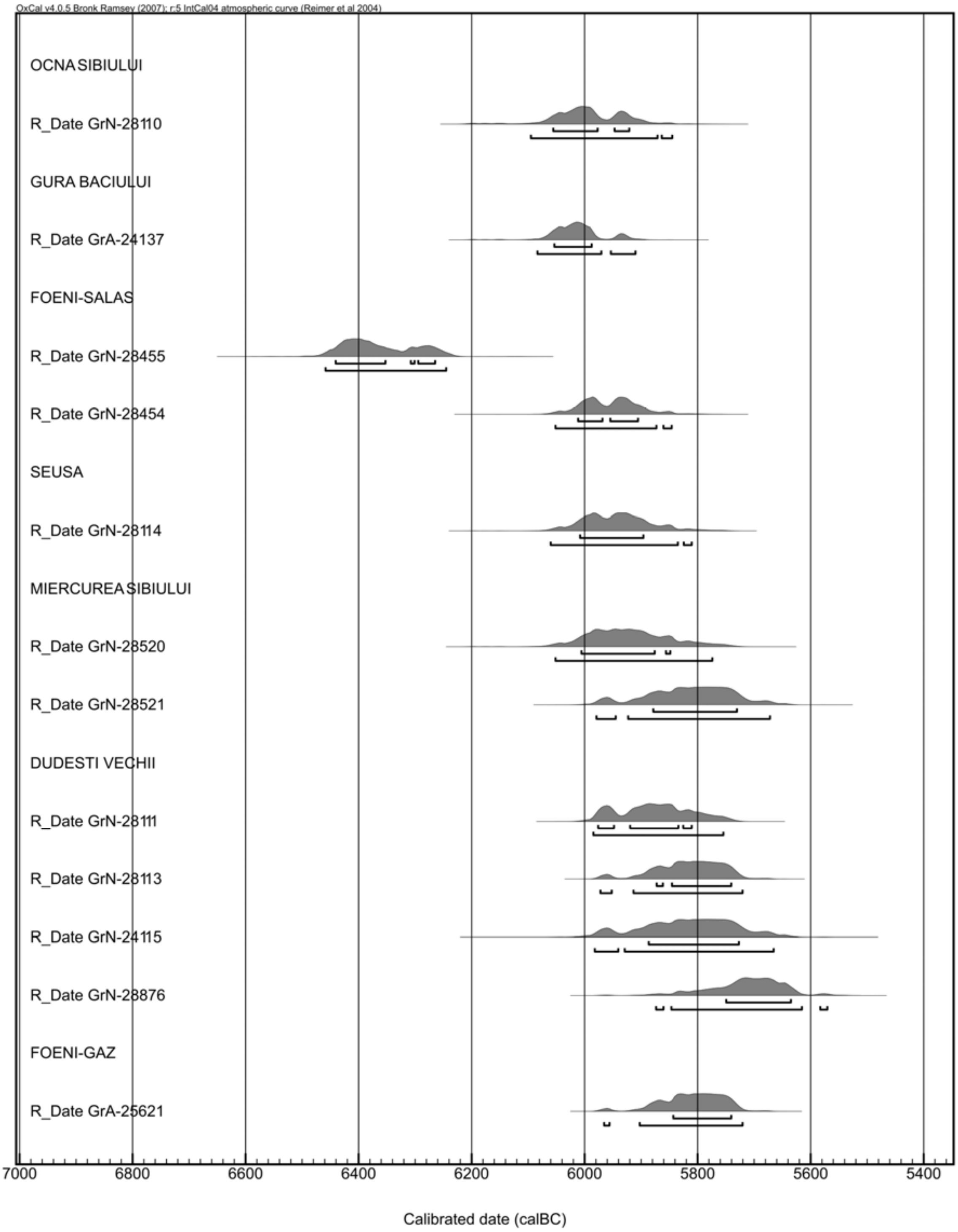

Figure 7. Radiocarbon dates from early pottery sites in Romania, calibrated individually.
Datele radiocarbon calibrate individual, provenite din siturile neolitice timpurii din România.

MACEDONIA (FYROM)

Anzabegovo

A correct interpretation of the Anza dates is hampered by conflicting age indications and level assignments in three different publications. For brevity's sake I will not go into the details of this situation, and will hold on to the dates as given by Gimbutas in the final Anza publication (Gimbutas 1976: 30). The two consecutive building levels Anza Ia and Ib may be seen as two short-time events and allow for using the COMBINE function. Anza Ia youngest dates LJ–3185 and 2347 are outliers and not used. Anza Ia combined has an agreement of 178.8% with *n*=4, and at 1σ is 6060–6010 cal BC. Anza Ib combined has an agreement of 166.2% *n*=5, at 6040–5980 (53.4%) and 5950–5920 (14.8%) at 1σ (without two youngest dates LJ–2333 and 2349). All in all, the time span of Anza Ia and Ib correlates rather well with that of Donja Branjevina and the single existing date for Gura Baciului as well as House 54 from Lepenski Vir.

When we constrain the probability distributions by calculating the phase boundaries for Anza Ia and Ib, results show a tight grouping, with an estimated beginning of Phase Ia between 6090–6020 cal BC (1σ), and an end of Phase Ib at about 6000 cal BC (Table 2;

Figure 8).

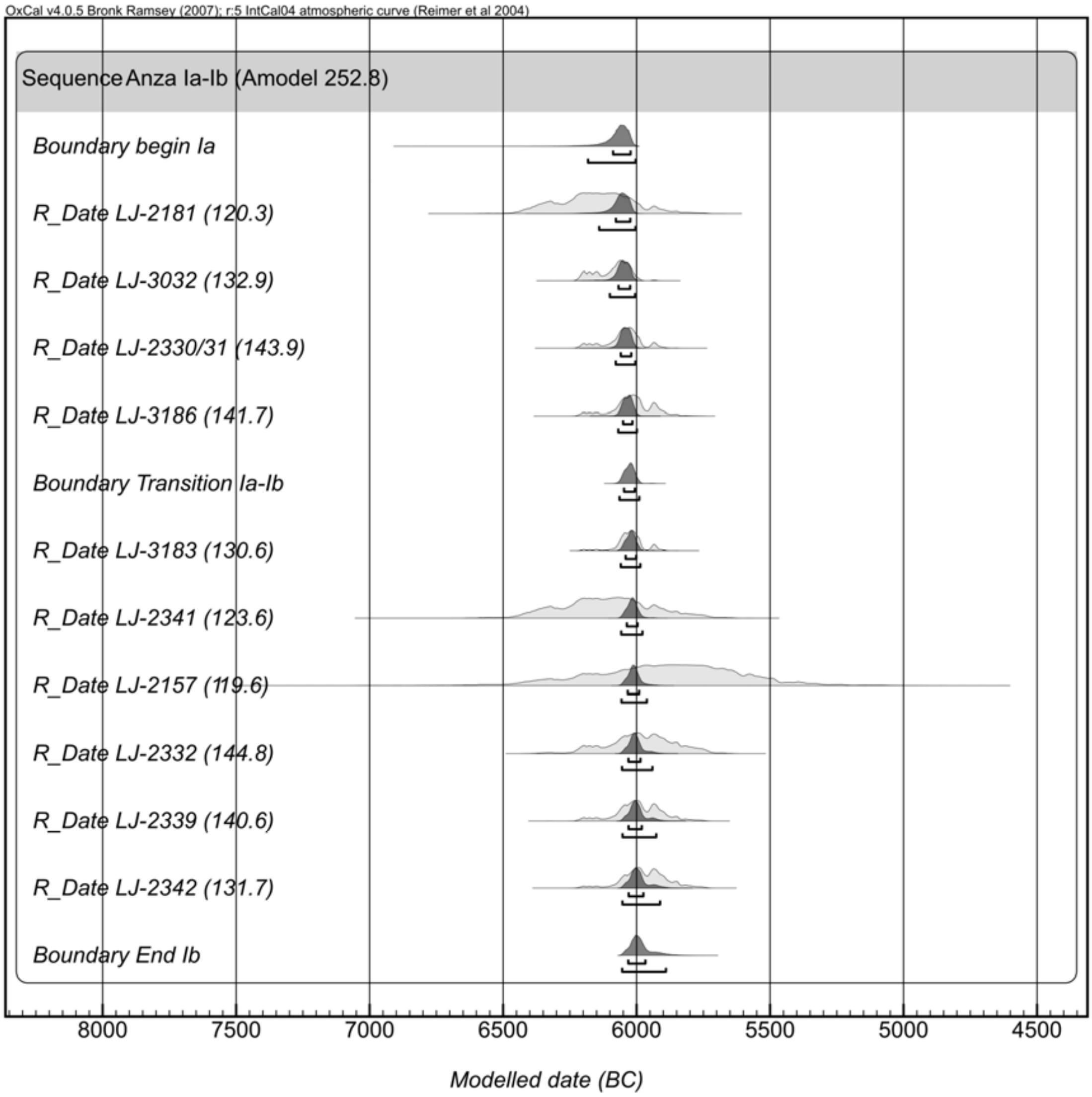

Figure 8. Anzabegovo, sequence model with calculated phase boundaries for beginning and end of Anza I. Dark grey distributions show modelled dates, the light grey areas signify the original, individually calibrated distribution.

Anzabegovo. Model secvenţial al datelor radiocarbon, cu limitele calculate pentru începutul şi sfârşitul fazei Anza I. Datele modelate sunt ilustrate în gri închis iar zonele gri deschis reprezintă datele originale, calibrate individual.

These estimates are very much in line with the dates acquired for the early pottery sites in the Danube catchment, and they seem to show that there is no significant time interval between the occurrence of pottery in Macedonia and in Serbia and Romania, and possibly also in Hungary (the early dates from Pitvaros).

Table 2. Anza I, grouping of dates into bounded phases.
Anza I, gruparea datelor radiocarbon pe faze.

Phase boundary	Cal BC (1σ range)
Beginning of Phase Ia	6090–6020
Transition Phase Ia–Ib	6050–6000
End of Phase Ib	6040–5960

CONCLUSION

As already pointed out by several other authors (Biagi and Spataro 2005, Biagi et al. 2005, Bonsall 2008), there is now abundant evidence that earliest pottery bearing sites in the Danube catchment date to 61st century cal BC at the earliest, and more precisely in the second half of that century. Mean values are mostly in the 61st/60th centuries with the exception of Blagotin, Lepenski Vir House 36 and Padina Houses 12 and 17, which have values in the 62nd century cal BC (Table 3). On the basis of specifically the Blagotin data, Bonsall (2008: 268, 272) argues that a farming site had been established at Blagotin at about 6200 cal BC, and contrasting this with his calculation that farming in Romania and the Iron Gates set in at about 6000 cal BC, he offers the explanation that the "spread of agriculture through the Balkan Peninsula came to a standstill c. 6200 cal BC to the south of the Danube, and a new phase of expansion began c. 6000 cal BC when agriculture spread rapidly along the Danube and in its tributaries in northeast Serbia, Hungary, and Romania" (Bonsall 2008: 268). In view of the incongruence between the dates and the pottery as published from Blagotin, this view cannot be upheld, and likely the Blagotin dates are too old or it is rather the younger extremes of the 1σ range (61st century) from Blagotin that should be favoured. The Padina ('above'!) House 12 date is surely too old for its context, and also Lepenski Vir House 36 and Padina House 17 dates have contextual issues that make these dates only weak candidates for pushing back the appearance of pottery into the 62nd century cal BC. The Anza boundary model for Phase I suggests that the site is not significantly older than the Serbian, Hungarian and Romanian early pottery sites, and a diffusion model from south to north thus finds no confirmation in the calculations presented here. Instead, most likely we have to do with a wide-spread, contemporary adoption and adaptation by the local populations of the techniques of pottery manufacture, possibly coinciding with the adoption of Neolithic subsistence models, as seems proven by the consistent inclusion of chaff from cereal processing.

Table 3. Danube catchment early sites with pottery.
Siturile neolitice timpurii din bazinul Dunării.

Site	Date cal BC (1σ)	OxCal function	Agreement	N dates
Padina above House 12	6650-6500	single date range		1
Blagotin-Poljna	6430-6260	single date range		1
LV House 36	6250-6080	R_COMBINE		2
Padina House 17	6230-6090	single date range		1
Grivac-Barice	6220-6030	single date range		1
Blagotin-Poljna	6220-6020	two date range		2
Anza Ia	6060-6010	COMBINE	178.8%	4
LV House 54	6060-5980	COMBINE	92.2%	5
Gura Baciului	6060-5980	single date range		1
Ocna Sibiului	6060-5920	single date range		1
Anza Ib	6040-5920	COMBINE	166.2%	6
Donja Branjevina	6030-5980	COMBINE	128.2%	3
Banja	6030-5810	single date range		1
Foeni-Sălaş	6020-5900	single date range		1
Şeuşa	6010-5890	single date range		1
Miercurea Sibiului	6010-5840	single date range		1
Magarećі Mlin	6000-5900	COMBINE	79.3%	2
Pitvaros	6000-5900	single date range		1
Divostin I	5990-5900	COMBINE	85.6%	5
Padina House 18	5970-5760	single date range		1
Endrőd 39	5920-5720	SUM		5
LV House 47	5910-5780	single date range		1
Vlasac House 1	5850-5730	COMBINE	81.6%	3
LV House 1	5850-5660	single date range		1
Ecsegfalva 23	5840-5650	SUM		11
LV House 37	5810-5680	R-COMBINE		2
LV House 16	5810-5630	single date range		1
Szarvas 23	5790-5560	two date range		2
Endrőd 119	5780-5640	SUM		9
Vlasac House 2	5780-5640	COMBINE	117.4%	2
LV House 32	5750-5640	single date range		1
Padina House 15 (below floor)	5730-5640	single date range		1

Table 4. Radiocarbon dates used in text, sites in alphabetic order. Abbreviations used: C=charcoal, A=antler, HB=human bone, AB=animal bone, CER=cereal; nd=no information available.
Datele radiocarbon menţionate în text şi siturile în ordine alfabetică. Abrevieri: C=cărbune, A=corn, HB=os uman, AB=os de animal, CER=cereale; nd=fără informaţie disponibilă.

Lab. no.	Date BP	cal BC (1σ)	Material	Level	Provenance
Anzabegovo (Gimbutas 1976: 30)					
LJ–2181	7270±140	6340–6000	C	Ia	trench V, unit 111
LJ–3032	7210±50	6210–6010	C	Ia	trench V, units 103, 106, 107, 111 and 120
LJ–2330/31	7170±60	6090–5980	C	Ia	trench VII, unit 257, fire pit
LJ–3186	7140±70	6080–5920	C	Ia	trench V, units 76–86, 116–124
LJ–3183	7150±50	6070–5980	C	Ia	trench V, units 90–110
LJ–3185	6830±70	5770–5640	C	Ia	trench V, units 125–155
LJ–2347	6700±150	5730–5480	C	Ia	trench V, unit 120
LJ–2341	7230±170	6350–5910	C	Ib	trench VII, unit 188
LJ–2157	6970±290	6210–5610	C	Ib	trench VII, unit 204
LJ–2332	7110±120	6100–5840	C	Ib	trench VII, unit 256
LJ–2339	7120±80	6070–5900	C	Ib	trench VII, unit 240
LJ–2342	7100±80	6060–5890	C	Ib	trench VII, unit 251
LJ–2333	6840±100	5840–5630	C	Ib	trench VII, unit 253
LJ–2349	6440±120	5520–5300	C	Ib	trench VII, unit 189
Banja (McPherron, Bucha and Aitken 1988: 381)					
Bln–873	7048±100	6030–5810	C	nd	pit, south sonda IIb
Blagotin-Poljna (Whittle et al. 2002: 113)					
OxA–8608	7480±55	6430–6260	A	nd	base of pit JA2, pit dwelling 7
OxA–8609	7270±50	6220–6070	HB	nd	pit dwelling 7
OxA–8760	7230±50	6210–6020	AB	nd	pit dwelling ZM 7
Divostin (McPherron, Bucha and Aitken 1988: 381)					
Bln–823	7080±180	6100–5740	C	I	feature 15 (earth-cabin 5)
Bln–866	7060±100		C	I	beneath floor House 14 (Divostin II)
Bln–866a	7200±100		C	I	beneath floor House 14 (Divostin II)
Bln–931	7050±100		C	I	beneath floor House 14 (Divostin II)
Bln–866, 866a and 931 from same sample. R_Combine: 7104±58 BP (6050–5910 cal BC at 1σ)					
Bln–862	6995±100		C	I	posthole
Bln–899	7200±100		C	I	posthole
Bln–862 and 899 from same sample. R_Combine: 7099±71 BP (6050–5900 cal BC at 1σ)					
Bln–824	6970±100	5980–5750	C	I	feature 15 (earth-cabin 5)
Bln–896	6945±100		C	I	feature 120E, pit 22
BM–573	6935±100		C	I	feature 120E, pit 22
Bln-896 and BM-573 from same sample. R_Combine: 6940±71 BP (5890–5740 cal BC at 1σ)					
Donja Branjevina (Groningen ^{14}C Database; Karmanski 2000: 186f.; Whittle et al. 2002: 114)					
GrN–15974	7155±50	6070–5990	AB	III ('monochrome phase')	trenchV/1987, hearth in pit dwelling
GrN–15976	7140±90	6090–5900	C	III ('monochrome phase')	trench V/1986(?)
GrN–15975	6955±50	5900–5760	AB	III ('monochrome phase')	trench V/1987, outside pit dwelling

GrN–24609	6810±80	5770–5620	C	II ('white-painted phase')	trench XXX/1996, pit 7
OxA–8557	7080±55	6020–5900	HB	Ib	trench II/1987, D corner, under house remains
OxA–8555	6845±55	5780–5660	AB	Ib	trench II/1987, wall/hearth
OxA–8556	6775±60	5720–5630	AB	Ib	trench II/1987, D corner, under house remains

Dudeşti Vechii (Biagi et al. 2005: 46f.)

GrN–28111	6990±50	5980–5810	AB	'Criş IIB'	ditch, trench 1, sector E4–5
GrN–28113	6930±50	5880–5740	AB	'Criş IIB'	trench 3, sector A2, 165 cm
GrN–24115	6920±80	5890–5720	AB	'Criş IIIA'	trench 3, sector A1, 75–80 cm
GrN–28876	6815±70	5750–5630	C	'Criş IIIA'	trench 1, sector C, square 1 and 2, oven

Ecsegfalva 23 (Whittle et al. 2002: 115)

OxA–9329	6950±45	5890–5770	AB	nd	23B, C-W box
OxA–9335	6920±50	5850–5730	CER	nd	23A 113 Flot 105
OxA–9526	6915±50	5850–5730	AB	nd	23B, S-E box
OxA–9327	6870±50	5840–5710	AB	nd	23B, C-E box
OxA–9333	6860±45	5800–5670	AB	nd	23B, S-E box
OxA–9334	6855±50	5790–5670	CER	nd	23A 113 Flot 105
OxA–9328	6815±50	5740–5650	AB	nd	23B, C-W box
OxA–9331	6815±45	5740–5660	AB	nd	23B, C-W box
OxA–9332	6810±45	5740–5646	AB	nd	23B, C-W box
OxA–9330	6795±50	5730–5640	AB	nd	23B, S-E box
OxA–9325	6690±50	5670–5530	AB	nd	23B, S-E box
OxA–10148	6665±50	5640–5530	AB	nd	23B, S-E box

OxA–9325 and OxA–10148 from same sample. R_Combine: 6678±35 BP (5640–5560 cal BC at 1σ)

Endrőd-Szujókereszt 39 (Groningen 14C database; Horváth & Hertelendi 1994: 122)

BM–1863R	6950±140	5990–5720	C	nd	trench IV/pit 1
BM–1868R	6970±110	5980–5740	C	nd	trench XVIII/pit 1,60–90 cm
BM–1870R	6950±120	5980–5730	C	nd	trench XVIII/pit 1, 90–120 cm
GrN–10319	6945±50	5890–5760	C	nd	refuse pit
BM–1871R	6830±120	5850–5620	C	nd	trench XIX/pit 1 (2)

Endrőd 119 (Whittle et al. 2002: 115)

OxA–9587	6915±45	5840–5740	AB	'Körös'	square 32, ash pit, 80–110 cm
OxA–9583	6895±45	5840–5720	AB	'Körös'	square 32, east ash pit
OxA–9588	6855±45	5790–5670	AB	'Körös'	square 29, ash pit below house, 65–90 cm
OxA–9586	6850±45	5770–5670	AB	'Körös'	square 32, below house ruins, west, 50–80 cm
OxA–9582	6825±45	5740–5660	AB	'Körös'	square 33, large pit below burnt ruins
OxA–9584	6825±45	5740–5660	AB	'Körös'	square 29, 'inside house', 30–40 cm
OxA–9590	6815±50	5740–5650	AB	'Körös'	square 33, large pit, bottom, 150–200 cm
OxA–9585	6795±50	5730–5640	AB	'Körös'	square 27, below house, 60–90 cm
OxA–9589	6720±45	5680–5560	AB	'Körös'	square 35, pit 1 bottom, 130–190 cm

Foeni-Gaz (Biagi et al. 2005: 46f.)

GrA–25621	6925±45	5850–5740	AB	'Criş IIB'	pit house 1, 125 cm

Foeni-Sălaş (Biagi et al. 2005: 46f.)

GrN–28455	7510±60	6450–6260	AB	'Criş IIA–IIB'	pit house, square 5, cut 0.5, locus 41
GrN–28454	7080±50	6020–5900	AB	'Criş IIA–IIB'	pit house, square 5, level 7, locus 23

Grivac-Barice (McPherron, Bucha and Aitken 1988: 381)

Bln–869	7250±100	6220–6030	C	'Starčevo'	pit, sonda B

Gura Baciului (Biagi et al. 2005: 46f.)

GrA–24137	7140±45	6060–5980	AB	'Criş IB–IC'	trench E-D, square 8, structure

Lepenski Vir (Quitta & Kohl 1969: 234f.; Radovanović 1996: 359f.)

KN-405	7430±160	6450–6100	C	I.1	house 62
Bln–575	6860±100	5850–5650	C	I.1	house 1
BM–379	6900±150		C	I.1	house 37, from floor
Bln–678	6900±100		C	I.1	house 37, from floor
Bln–649	6800±100		C	I.1	house 37, from floor

BM–379, Bln–678, Bln–649 from same sample. R_Combine: 6860±64 BP (5810–5670 cal BC at 1σ)

Bln–647	6845±100	5840–5640	C	I.1	house 9
Bln–740a	7310±100		C	I.2	house 36, timber beam
Bln–740b	7360±100		C	I.2	house 36, timber beam

Bln–740a and Bln–740b from same sample (#13/68). R_Combine: 7335±71 BP (6330–6320 (1.4%), 6240–6080 (66.8%))

Z–143	7300±124		C	I.2	house 54, hearth
KN–407	7280±160		C	I.2	house 54, hearth
Bln–738	7225±100		C	I.2	house 54, hearth
Z–115	6984±94		C	I.2	house 54, hearth
Bln–653	7040±100	6020–5810	C	I.2	house 54

Z–143, KN–407, Bln–738, Z–115 all from same sample (#12/68). R_Combine: 7165±56 BP (6080–5980 cal BC at 1σ)

UCLA-1407	6970±60	5970–5770	C	I.2	house 47
Bln–576	6820±100	5810–5620	C	I.2	house 16
Bln–652	6620±100	5630–5480	C	I.2	house 51
Bln–650	6820±100	5810–5620	C	I.2–I.3	houses 34+43
KN–406	7210±200	6350–5880	C	I.3	house 27
P–1598	6814±69	5750–5630	C	I.3	house 32, hearth
Bln–654	6630±100	5630–5480	C	II	house IX
Bln–655	6560±100	5630–5380	C	II	house XXXII

Magareći Mlin-Apatin (Groningen ^{14}C Database)

GrN–15973	7130±60	6060–5920	AB	nd ('early Starčevo' pottery)	house no.3, hearth
GrN–15972	7015±50	5990–5840	AB	nd ('Starčevo' pottery)	inside house no. 3
GrN–15971	6910±45	5840–5730	AB	nd ('Körös' pottery)	pit in house no.3

Miercurea Sibiului (Biagi et al. 2005: 46f.)

GrN–28520	7050±70	6010–5840	AB	'Criş IB'	pit house 10
GrN–28521	6920±70	5880–5730	AB	'Criş IC–IIA'	pit house 4a

Ocna Sibiului (Biagi et al. 2005: 46f.)

GrN–28110	7120±60	6060–5920	AB	VIII ('Pre-Criş')	nd

Padina (Clason 1980: 144; Groningen ^{14}C database; Burleigh and Matthews 1982: 168f; Whittle et al. 2002: 113; Borić & Miracle 2004; period assignments of Burials according to Roksandić 2000: 28)

OxA–9034	7755±65	6650–6500	AB	nd	sector III, above house 12
OxA–9053	7685±60	6590–6460	AB	nd	sector III, house 18, below floor
OxA–9056	7625±55	6560–6420	AB	nd	sector III, house 9
OxA–11103	7315±55	6230–6090	AB	nd	sector III, House 17,

					hearth
GrN–8230	7100±80	6060–5890	C	Padina B2	sector III, culture layer
GrN–?	7065±110	6060–5830	nd	Padina B1	nd
GrN–7981	7075±50	6010–5900	C	Padina B3	sector III, trapezoidal-house floor
OxA–9052	6965±60	5970–5760	A	Nd	sector III, house 18, floor
OxA–9054	6790±55	5730–5640	AB	Nd	sector III, house 15, below floor
GrN–8229	6570±55	5610–5480	C	Padina B1	sector III, hearth trapezoidal house
GrN–7980	6565±40	5550–5480	C	Padina A	nd
Padina Burials					
OxA–11108	7750±50	6640–6500	A	Padina A-B	sector I, burial 1a
BM–1143	7738±51	6630–6500	HB	Padina A-B	sector I, burial 2
OxA–11107	7525±77	6460–6260	HB	Padina A-B	sector I, burial 1a
Pitvaros (Whittle et al. 2002: 115)					
OxA–9336	7060±45	6000–5900	C	nd	Pit 3/B
OxA–9392	6885±50	5840–5720	AB	1	nd
OxA–9393	6940±50	5880–5750	AB	3–4	nd
Şeuşa (Biagi et al. 2005: 46f.)					
GrN-28114	7070±60	6010–5890	AB	nd ("Pre-Criş")	nd
Szarvas 23 (Bowman et al. 1990: 73; Whittle et al. 2002: 114)					
OxA–9375	6855±55	5790-5670	HB	nd	grave 1
BM–1866R	6780±110	5790-5560	C	nd	trench IX/pit 1
BM–1865R	6400±170	5550-5210	C	nd	trench VIII/pit 1
Vlasac (Srejović and Letica 1978)					
Z–262	7000±90	5990-5790	C	Vlasac Ib	layer 26, square C/III, house 1
Bln–1051	6905±100	5900-5700	C	Vlasac Ib	layer 26, square C/III, house 1
Bln–1051a	6790±100	5790-5570	C	Vlasac Ib	layer 26, square C/III, house 1
Bln–1053	6865±100	5870-5660	C	Vlasac Ib	layer 18, square a/18, house 2
Bln–1014	6805±100	5800-5620	C	Vlasac Ib	layer 18, square a/18, house 2
Vlasac Burials					
Z–268	6713±90	5720-5550	nd	nd	burial 11, fill
Z–264	6335±92	5470-5210	nd	nd	burial 54, fill

Notes

1. All calculations are based on the IntCal04 calibration curve (Reimer et al. 2004), and carried out with OxCal v4.0.5 (Bronk and Ramsey 1995, 2001). In this article, ^{14}C measurements are standardly rounded by 10, ranges are quoted with 1sigma confidence intervals.

2. Settlement continuity, albeit with important temporal gaps, is, for instance, attested at the S Romanian site of Teleor 003/Măgura, occupied intermittently during the whole 6th mill. cal BC (Bailey et al., *in press*; Thissen et al. 2007).

3. All radiocarbon dates discussed in this text are given in Table 4 with full details.

4. The association of pottery and houses at Lepenski Vir is a hot issue. The following houses contain pottery: 1, 4, 15, 16, 19, 20, 24, 26, 28, 32, 35, 37, 46, 47, 54 – allegedly in minor quantities (Srejović 1972: 134; cf. Borić 1999: 48; Budja 1999: 136 Tab. 1). Sherds were also found between the floors of Houses 36 and 35 (Garašanin and Radovanović 2001: 118). According to Budja (1999: 135 n7), Srejović has published two different lists of houses associated with pottery. House 48 should in fact be added to the more extensive list just mentioned. Perić and Nikolić (2004: 162) state that the pottery found on House 6 floor and around a stove in House 5 (170f.) is intrusive and they reassign it to a younger (LV III) level (cf. Garašanin and Radovanović 2001: 121 n8).

5. According to Quitta, almost all (Berlin) samples consisted of charcoal from *Quercus* and *Ulmus* (Quitta *apud* Srejović 1972: 205).

6. Note, however, that Quitta considered the possibility the ^{14}C dates from IX and XXXII might be too late for the context they should date (LV II), and could belong to LV III instead (Quitta *apud* Srejović 1972: 207, cf. also Garašanin and Radovanović 2001: 120 n5). Such a scenario would however ignore the house 51 evidence.

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