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The Spread of the Neolithic to  
Central Europe

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R | G | Z | M

Detlef Gronenborn · Jörg Petrasch (Hrsg.)

## **DIE NEOLITHISIERUNG MITTELEUROPAS**

Internationale Tagung, Mainz 24. bis 26. Juni 2005

## **THE SPREAD OF THE NEOLITHIC TO CENTRAL EUROPE**

International Symposium, Mainz 24 June - 26 June 2005

Die Neolithisierung – der Übergang von der wildbeuterischen zur Nahrungsmittel produzierenden Lebensweise und damit auch der Übergang von Mobilität zu permanenter Sesshaftigkeit – ist in der Geschichte der Menschheit wohl eines der einschneidendsten Ereignisse überhaupt. Die 37 in diesem Band abgedruckten Artikel sind die aktualisierten Vorträge eines 2005 in Mainz abgehaltenen internationalen Symposiums mit dem Thema »Die Neolithisierung Mitteleuropas«, an dem mehr als 90 Wissenschaftler aus 16 Ländern teilnahmen. Die Beiträge geben einen Überblick über den derzeitigen Stand der Forschungen und decken Themen ab, die vom Nahen Osten, der Balkanhalbinsel über das Karpatenbecken bis zur Ostsee und weiter bis nach Frankreich und Italien reichen. Unter Berücksichtigung neuester Forschungsansätze, etwa der Paläoklimatologie und der Archäogenetik, werden die zentralen Fragen behandelt: Was ist die Neolithisierung? Wie lange dauerte sie? Was waren ihre Ursachen und Mechanismen, und wie lief sie ab?

Neolithisation – the transition from an acquiring to a producing mode of subsistence which includes the transition from mobility to full-time sedentism – marks a fundamental change in the history of humankind. Published in this volume are 37 articles which are the updated versions of contributions to a symposium held in Mainz in 2005 with the title »The Spread of the Neolithic to Central Europe«. It was attended by over 90 scholars from 16 countries. The articles allow an insight into the current state of debate with topics reaching from the Near East to the Balkan Peninsula, the Carpathian Basin, further to the Baltic Sea, to France, and to Italy. By applying new approaches of palaeoclimatology and archaeogenetics any of the central questions is covered: What is neolithisation? How long did it last? What were the causes, what were the mechanisms, and how did it happen?

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## THE NEOLITHISATION OF THE CENTRAL BALKANS: LEAPFROGGING DIFFUSION AND CULTURAL TRANSMISSION

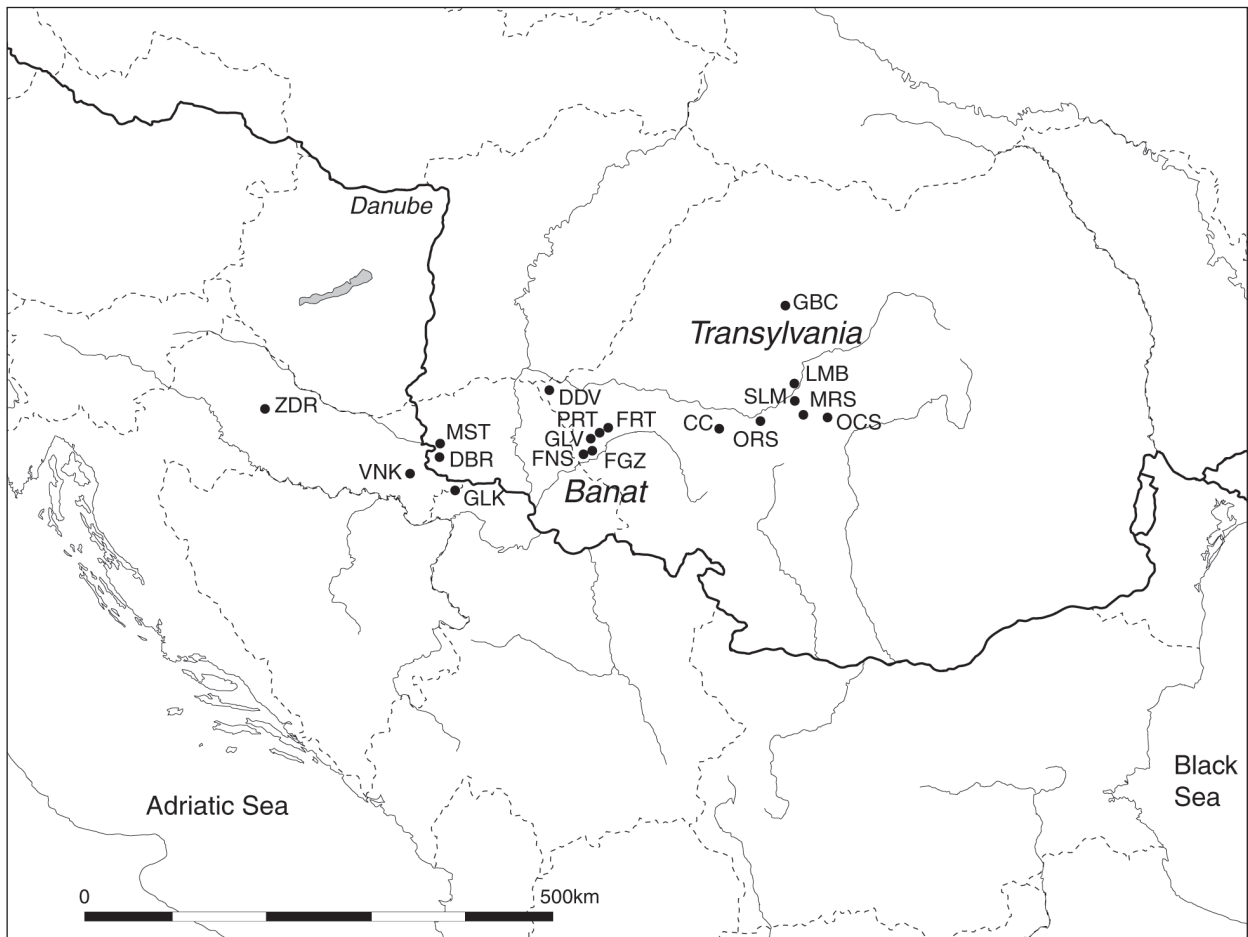
The emergence of the Early Neolithic Starčevo-Criş-Körös (SCK) cultural complex in the Central Balkans represents a key stage in the neolithisation of Europe. The SCK phenomenon is identified with the spread of farming across a broad region, stretching from Macedonia (Mitrevski 2003) and Albania (Korkuti 2007) in the south, to Romania (Lazarovici 1979; 1993), Slavonia (Minichreiter 1992; 2007), and Hungary (Makkay 1992; 1998; 2007) in the north. The first farmers have always been associated with their pottery, in particular white-on-red painted ware, because little is known about other aspects of their economy and material culture (e.g. settlement patterns, lithic industry, archaeobotany). These communities are found throughout this territory, and they seem to have had a homogeneous cultural assemblage. In contrast, apart from the Iron Gates region (Bonsall et al. 2000; Borić / Miracle 2004; Srejović 1971; 1972), little or nothing is known about the Late Mesolithic period in the same territory. The regularity and extent of the Early Neolithic cultural complex provoke a number of questions: Where did it originate? How was it diffused? How quick was this process?

In 2003 a project entitled »The Early Neolithic in the Balkans: ceramic analysis and cultural processes« was initiated at the Institute of Archaeology (UCL, London)<sup>1</sup>. Under this project, pottery and radiocarbon samples were obtained from Starčevo-Criş sites in Romania, Serbia, and Slavonia, in order to (a) describe the technology of pottery production over a broad area and a significant time-depth (based on stratigraphy and typological seriation) and (b) to define the absolute chronology of this culture. The new data will transform our understanding of the nature of the SCK phenomenon and of its contribution to the neolithisation of Central Europe. The ceramic analyses show that although pottery was probably always manufactured locally, the technology to produce it was the same throughout the Starčevo-Criş territory, regardless of vessel form or decoration (Spataro 2006). The radiocarbon results indicate a very rapid expansion of the Starčevo-Criş complex from its source in the Southeastern Balkans and apparently synchronous transitions between typological phases right across the Starčevo-Criş territory (Biagi / Shennan / Spataro 2005).

### Methodology

The study material, from nineteen sites excavated since the end of the 19<sup>th</sup> century (**fig. 1; tab. 1**)<sup>2</sup>, was generously provided by archaeologists working in museums and universities in Slavonia, Serbia, and Romania. In 2002-2005 the writer collected one or two soil samples at about 500 m from each site.

At least twenty-five to thirty-five ceramic samples from each site were analysed in thin section using polarised microscopy and by Scanning Electron Microscopy in association with Energy Dispersive Spectrometry (SEM-EDS). The thin section analysis allows us to define the technological phases, the fabric, and possibly the provenance of the ceramics, whereas the SEM-EDS has been used to test the ceramic groups defined microscopically and to identify common elements between the fabrics of ceramics from different settlements. The soils were studied in thin section and by X-Ray Diffraction (XRD) in order to identify similarities or dissimilarities with the fabrics of the potsherds (Spataro 2002, 41).



**Fig. 1** Distribution map of the Starčevo-Criș sites from which samples were analysed. Legend: CC: Cauce Cave. – DBR: Donja Branjevina. – DDV: Dudeștii Vechi. – FGZ: Foeni Gaz. – FNS: Foeni Sălaș. – FRT: Fratelia. – GBC: Gura Baciului. – GLV: Giulvăz. – GLK: Golokut-Vizić. – LMB: Limba Bordane. – MST: Mostonga. – MRS: Miercurea Sibiului Petriș. – OCS: Ocna Sibiului. – ORS: Orăștie. – SLM: Șeușa La-cărarea morii. – VNK: Vinkovci. – ZDR: Ždralovi (Drawing by J. Meadows and M. Spataro).

When suitable material was available, single-entity organic samples – in particular cattle (*Bos*) bones – were selected for radiocarbon dating. These were dated at the Rijksuniversiteit Groningen laboratory, using both gas proportional counting (GrN-) and accelerator mass spectrometry (GrA-). The results shown in **table 2** were calibrated using the INTCAL04 dataset (Reimer et al. 2004) and the program OxCal v3.10 (Bronk Ramsey 2001).

## Results

Analysis of potsherd samples indicates that the same technological »formula« was used at all nineteen sites studied. The potters used mainly non-micritic and micaceous clays, rich in fine alluvial quartz sand, and tempered these with abundant organic matter, mainly wheat and barley chaff. The ceramics were fired in open fires, at rather low temperatures, not exceeding 650-700°C. The same formula was used to manufacture vessels with different shapes and surface treatments, such as globular red-slipped ware and long-necked vases with rough surfaces (Spataro 2004-2005; 2006). The same technology was used throughout a wide

Phase	Slavonia	Serbia	Banat	Transylvania
LBK	Tomasica			
SC IV				Gura Baciului Cauce Cave
SC IIIA-B	Ždralovi Vinkovci (II-IV)	Golokut (Spiraloid)	Giulvăz Pața Dudeștii Vechi (II-III)	Limba Bordan Gura Baciului
SC IIA-B		Mostonga	Dudeștii Vechi (II-III) Foeni Sălaș Foeni Gaz Fratelia	Gura Baciului Miercurea Sibiului-Petriș Orăștie
SC IA-C		Donja Branjevina		Gura Baciului Miercurea Sibiului-Petriș Ocna Sibiului Șeușa La-cărarea morii

**Tab. 1** Sites from which pottery was analysed, by Starčevo-Criș (SC) typological attribution and region.

area, from Vinkovci and Ždralovi (Minichreiter 1992) in eastern Croatia to Ocna Sibiului-Triguri (Paul 1995) in central-eastern Romania (**fig. 2**).

Furthermore, this formula remained in use throughout the Early Neolithic. Analysis of pottery from the site of Gura Baciului in the Cluj district of Transylvania (Lazarovici / Maxim 1995), for example, where all four Starčevo-Criș (SC) typological phases (SC IB/IC-SC IV) are represented, shows that it was produced using the same technological formula over a period of almost a millennium (Spataro 2008; in prep.).

Despite the uniformity of pottery technology, all the analyses of ceramics from Serbia, Slavonia, and Romania suggest local production. This is shown by the comparison of the sherd fabrics with the fabric of the soil and river sand samples collected near the sites and the local geology. Comparison of the pastes of ceramics from neighbouring and contemporary sites, such as Foeni-Gaz and Foeni-Sălaș in the Romanian Banat (Spataro 2006), or Mostonga (Karmanski 1978) and Donja Branjevina (Karmanski 2005) in Serbia, reinforces this conclusion. There is no evidence that pottery was exchanged between sites.

The radiocarbon results show that the Starčevo-Criș Culture appeared around the beginning of the sixth millennium cal BC and lasted 700-800 years (**fig. 3**). These results are consistent with the four-phase typological model proposed by Lazarovici (1979). Phase I (SC IA/C) results are apparently earlier than those from Phase II (SC IIA/B) strata, which in turn are older than Phase III (SC IIIA/B) results. It is difficult to determine the duration of each phase, but it appears that Phases I, II, and IV each lasted a century or two, whereas Phase III lasted much longer (c. 400 years).

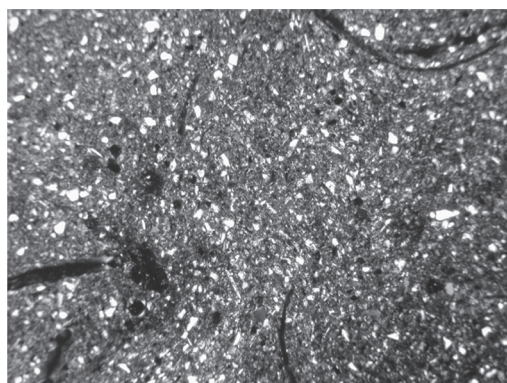
The so-called monochrome phase (Lazarovici's IA) seems to have appeared almost simultaneously over a wide territory, from the Vojvodina to eastern Transylvania, at sites such as Donja Branjevina and Ocna Sibiului (**tab. 2**), which are about 400 km apart, at around 6000 cal BC. Similarly, it is difficult to detect much difference in the dates of the earliest SCK sites along a gradient from south to north. The first such site in Hungary may be no more than 200 years after Golubnik (or Gălâbnik) in Bulgaria (Pavúk / Cohadžiev 1984). The imprecision of radiocarbon dating (relative to the time period involved) and the lack of data from Macedonia mean that the exact route of Neolithic diffusion within the Balkans cannot yet be identified. As already discussed in detail by Biagi, Shennan, and Spataro (2005), most of the earliest Neolithic sites

Site	Phase	Material	Laboratory number	Radiocarbon result	Calibrated date (95% confidence)
Foeni- Sălaş	IIA-B	<i>Bos primigenius</i> , calcaneum	GrN-28455	7510±60	6470–6230 cal BC
Gura Baciului	IB-C	long bone flake	GrA-24137	7140±45	6080–5910 cal BC
Ocna Sibiului	Pre-Criş	<i>Bos</i> sp., radius	GrN-28110	7120±60	6080–5880 cal BC
Foeni-Sălaş	IIA-B	<i>Bos</i> sp., radius	GrN-28454	7080±50	6060–5840 cal BC
Şeuşa La-cărarea morii	Pre-Criş	<i>Bos</i> sp., humerus	GrN-28114	7070±60	6060–5830 cal BC
Mercurea Sibiului Petriş	IB	<i>Bos</i> sp., astragalus	GrN-28520	7050±70	6060–5750 cal BC
Dudeştii Vechi	IIB	<i>Cervus elaphus</i> , humerus	GrN-28111	6990±50	5990–5730 cal BC
Dudeştii Vechi	IIB	<i>Bos</i> sp., astragalus	GrN-28113	6930±50	5980–5710 cal BC
Foeni-Gaz	IIB	long bone flake	GrA-25621	6925±45	5970–5710 cal BC
Dudeştii Vechi	IIIA	bone perforator	GrA-24115	6920±80	5990–5650 cal BC
Mercurea Sibiului Petriş	IC-IIA	<i>Bos</i> sp., long bone fragment	GrN-28521	6920±70	5990–5660 cal BC
Parţa 2	IIIA	<i>Cervus elaphus</i> , metatarsal	GrN-28460	6860±60	5890–5630 cal BC
Dudeştii Vechi	IIIA	acorn ( <i>Quercus</i> ), fruit	GrA-26951	6845±40	5810–5650 cal BC
Dudeştii Vechi	IIIA	charcoal ( <i>Quercus</i> , <i>Ulmus</i> )	GrN-28876	6815±70	5850–5610 cal BC
Parţa	IIIB	charcoal ( <i>Quercus</i> , <i>Fraxinus</i> , <i>Ulmus</i> )	GrN-28877	6800±50	5760–5620 cal BC
Mostonga III	Starčevo	<i>Cervus elaphus</i> , antler	GrA-24117	6750±50	5730–5560 cal BC
Giulvăz	IIIB	<i>Cervus elaphus</i> , antler	GrN-28456	6720±80	5740–5480 cal BC
Parţa 2	IIIB	<i>Bos</i> sp., ulna	GrN-28459	6660±60	5670–5480 cal BC
Limba Bordane	?	<i>Bos primigenius</i> , metacarpal	GrN-29052	6620±60	5650–5470 cal BC
Limba Bordane	IIIB	<i>Bos</i> sp., radius	GrN-28457	6580±60	5630–5460 cal BC
Limba Bordane	IV	<i>Bos</i> sp., rib	GrN-28112	6290±50	5370–5080 cal BC
Mercurea Sibiului Petriş	?	<i>Bos</i> sp., mandible (charred)	GrA-26606	6180±40	5290–5000 cal BC

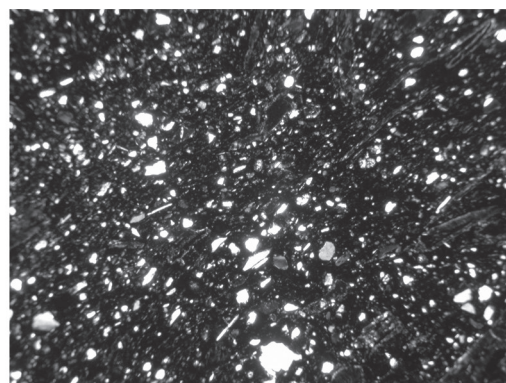
**Tab. 2** The radiocarbon results (after Biagi / Shennan / Spataro 2005, with three new results) Phase: Starčevo-Criş typological attribution.

are located along tributaries of the Danube, some of them near salt outcrops, such as Ocna Sibiului, Gura Baciului, and Miercurea Sibiului Petriş (Luca / Suciuc 2007; **fig. 1**).

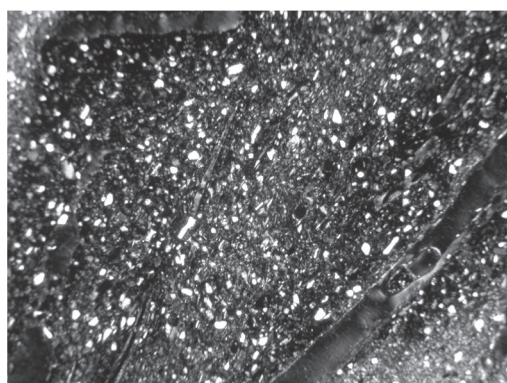
In later phases, the settlement pattern is similarly focussed on the river network (e.g. Gura Baciului phase IV, Vultureni, Limba Bordane). Phase II forms (Proto-Starčevo and Linear B Phase) seem to appear contemporaneously across this territory, at sites such as Miercurea Sibiului Petriş in central-eastern Transylvania, and Foeni-Sălaş, Foeni-Gaz, and Dudeştii Vechi in eastern Banat (**tab. 2**; **fig. 3**). Phase III forms (representing the classical Starčevo-Criş Culture, or Girlandoid and Spiraloid A phases, with typical *barbotine* ware) also seem to appear throughout the region more or less simultaneously. It is not clear that the SCK complex ended abruptly, but this may simply reflect the lack of radiocarbon dates from Phase IV (Final Starčevo) and the subsequent Middle Neolithic cultures.



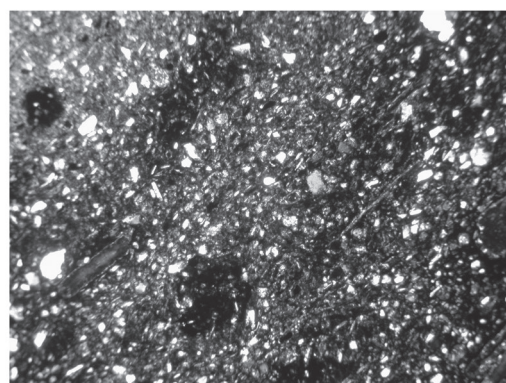
(a) VNK 15



(c) GBC 74



(b) GLK 16



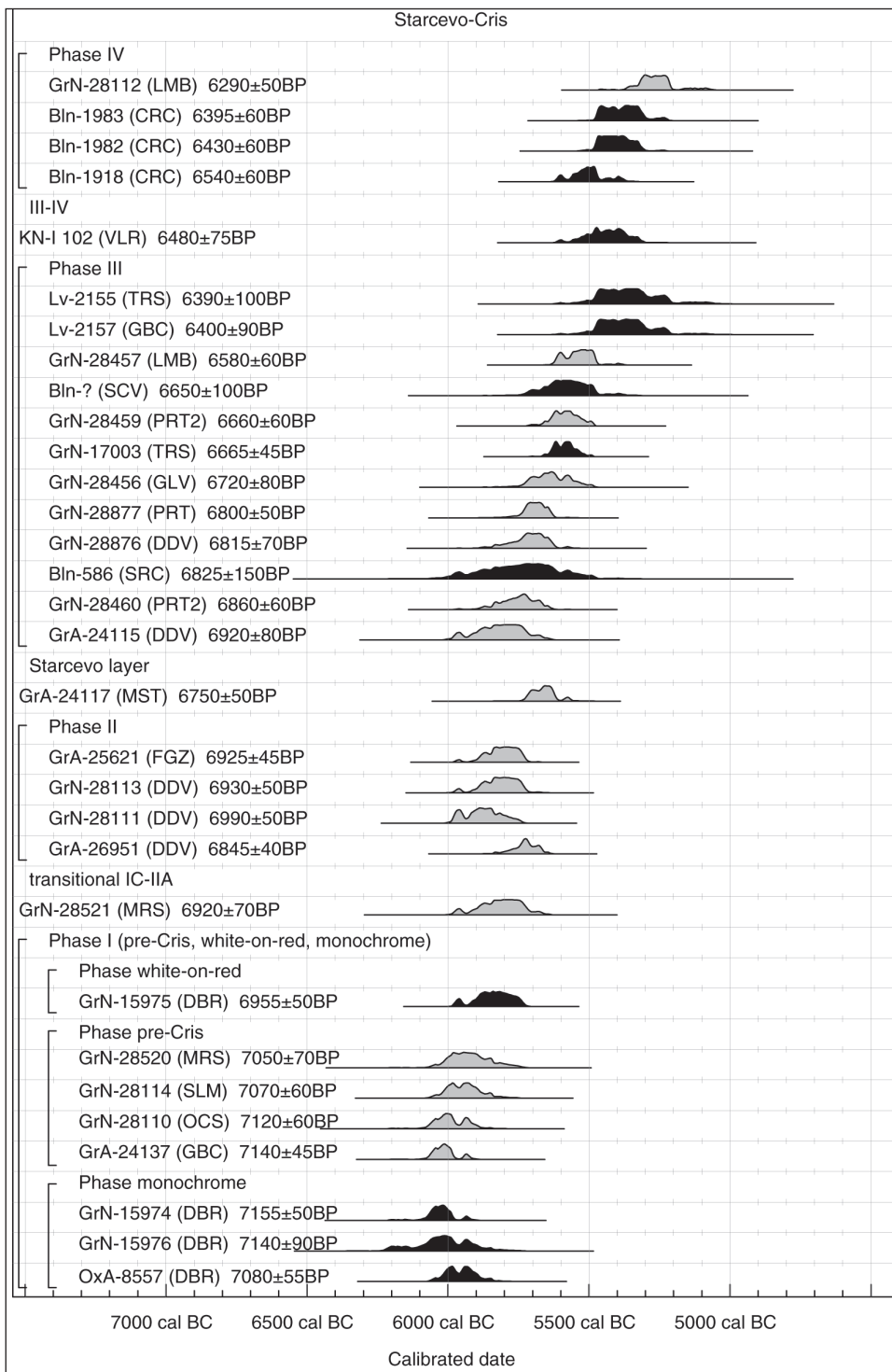
(d) SLM 17

**Fig. 2** Photomicrographs of thin sections. (a) Vinkovci sample 15 (Croatia, Girlandoid phase). – (b) Golokut sample 16 (Serbia, Spiraloid phase). – (c) Gura Baciului sample 74 (Romania, phase IV). – (d) Şeuşa La-cărarea morii sample 17 (Romania, Pre-Criş/IC-IIA phase). – The four fabrics show a non-micritic and micaceous matrix, with very well sorted, fine quartz sand, tempered with organic matter (elongated voids) (XPL,  $\times 40$ ).

## Discussion

According to the wave-of-advance model (Ammerman / Cavalli-Sforza 1971), the neolithisation of Europe involved two processes, cultural diffusion and demic diffusion. The former entails an exchange of goods and ideas between Neolithic and Mesolithic communities; the latter is a slow and continuous unidirectional movement of the Neolithic population, not colonisation (Ammerman 2002, 15).

It is difficult to argue that the neolithisation of the Central Balkans was a process of cultural diffusion from Neolithic neighbours to indigenous Mesolithic communities, because of the near-absence of evidence of Late Mesolithic occupation in this region (Pâunescu 2001). The alternative explanation, demic diffusion, implies the spread of people, rather than of items or concepts. Under current models (e.g. Hazelwood / Steele 2004), this kind of expansion should proceed at a rate of no more than c. 1 km per year, because there are natural limits to population growth rate. In the Central Balkans, however, the radiocarbon data show that neolithisation occurred at a rate of c. 3-6 km per year on average (see also Guilaine 2003). This implies »leapfrogging« to dispersed locations, which had all the prerequisites for Neolithic settlement (Biagi / Shennan / Spataro 2005) such as alluvial soil, salt, and pasture. This is a different pattern, apparently,



**Fig. 3** Calibrated radiocarbon results, Starčevo-Criș sites in Romania and Serbia. Distributions in grey represent samples dated under the Leverhulme project. Other dates are referenced in Biagi / Shennan / Spataro 2005. Sites: CRC: Cîrcea. – LMB: Limba Bordan. – VLR: Valea Raii »Copăcelu«. – TRS: Trestiana. – GBC: Gura Baciului. – SCV: Sacarovca I. – PRT and PRT2: Parta. – DDV: Dudeștii Vechi. – SRC: Soroca II »Trifauti«. – MST: Mostonga. – FGZ: Foeni Gaz. – DBR: Donja Branjevina. – MRS: Miercurea Sibiului Petriș. – SLM: Șeușa La-cărarea morii. – OCS: Ocna Sibiului.

to that noted for the Impressed Ware Culture, which gradually spread along the Middle Adriatic coastlines over the course of the sixth millennium cal BC (Biagi / Spataro 2002 fig. 3; Forenbaher / Miracle 2005). This interpretation (a dispersed Neolithic settlement pattern with low population density) fits with the absence or poor evidence of anthropogenic impact on the environment during the Early Neolithic<sup>3</sup>. In Croatia, the Dinaric Alps clearly functioned as barriers to the dispersal of the Starčevo-Criș Culture, and it is possible that dense lowland forest was also relatively impassable, funnelling the spread of the Neolithic along river corridors. The extent and density of lowland forest at this time is uncertain, as the dated pollen

diagrams are from high-altitude sites (Willis 1994; Feurdan 2005; Tantau et al. 2006). The onset of farming in river valleys is therefore not easily identifiable in the pollen record<sup>4</sup>.

The material culture throughout the SCK zone is reasonably homogenous. The forms and decoration of everyday pottery are very consistent and, as discussed earlier, pottery was produced using the same technology at each site investigated. Bone spoons and possibly clay seals show a similarly consistent typology throughout the area (Nandris 1971; Karmanski 2005). V-base spoons were probably manufactured using aurochs (*Bos primigenius*) metacarpals (Nandris 1971, 80). Their shape is uniform throughout this region and they are different from those of their neighbours such as the Cardial Impressed Ware and the *Linearbandkeramik* cultures (Nandris 1971). New analyses show that obsidian from Slovakian and Hungarian sources began to be traded throughout the Balkans in the Early Neolithic (Williams-Thorpe / Warren / Nandris 1984; Biagi / Gratuze / Boucetta 2007).

Besides having common utilitarian traditions, SCK sites show strong similarities in the symbolic sphere. So-called cult objects, such as figurines and altars, uncovered at many, but not all, sites, show common elements in iconography. Female figurines with exaggerated buttocks, well-defined eyebrows, nose, and sometimes hair (Karmanski 2005, Plates 1-4), and altars (mainly three- or four-legged containers) with a clear typology (Maxim 1999, 204-209) suggest a shared religious or cultic world-view. This appears to have been rather inward-looking – there is practically nothing that can be said to have been borrowed from adjacent cultures; one of the very few exceptions is a *rhyton* from Donja Branjevina (Karmanski 2005, 46)<sup>5</sup>. A recent review (Perlès 2005) emphasises the differences between the SCK and Greek Early Neolithic material cultures.

These persistent regularities tend to suggest that there was a significant degree of interaction between communities within the SCK zone, but relatively little contact with neighbouring cultural groups. The earliest Neolithic in Slovakia (Kozłowski / Nowak / Vizdal 2003) and Austria (Lenneis / Lüning 2001) is the *Linearbandkeramik* (LBK). The Körös Culture only extended as far as Hungary; its northernmost boundary corresponds to the palaeo-bed of the Tisza River in the Berettyó Valley (Biró 2003, 101), part of the so-called Central European – Balkan Agro-Ecological Barrier which »determined the settlement and expansion possibilities of the Early Neolithic Körös culture« (Sümeği 2003, 58).

Two cultural phenomena can be observed in the Balkans during the Early Neolithic: vertical and horizontal transmission. The repetitive and systematic techniques of producing ceramics and figurines (Spataro in prep.) indicate that potters transmitted their expertise orally to the young (children?)<sup>6</sup>. Hence, this knowledge was transmitted between generations (vertical transmission). This would explain not only the consistent use of the same type of raw materials and temper, but also the recurrence of shapes and decorative motifs on the vessels. At Gura Baciului, for example, local pottery methods of production were maintained for over eight hundred years (Spataro 2007). On the other hand, this cultural package of shapes, motifs, surface treatments, and technology was transmitted within generations over a broad geographical area (horizontal transmission); this is evident in the synchronous transitions between Starčevo-Criş typological phases. For example, the Early Neolithic ceramics analysed from Slavonia, Serbia, and Romanian Banat were produced using almost identical non-micritic and micaceous raw materials, tempered with abundant vegetal matter (such as cereal chaff), and fired in bonfires at rather low temperatures (Spataro in prep.).

This formula contrasts with the contemporary production of Impressed Ware pottery along the eastern Adriatic coast (Spataro 2004b). The latter was manufactured without organic addition, using mainly calcareous raw materials and mineral tempers, such as crushed calcite (Spataro 2002). We can observe vertical transmission here as well, because this technology (exploitation of micritic clays, tempered with crushed calcite) lasted into the Middle and the late Middle Neolithic, with the Danilo and Hvar cultures (Spataro 2002, 195-198). The use of different but internally-consistent pottery production formulas by the Impressed

Ware and Starčevo-Criş potters is an example of a cultural boundary. The technological boundary appears to coincide geographically with the typological boundary, which, as noted earlier, also represents the limit of the distribution of characteristic artefacts such as altars, figurines, and bone spoons on one side, and the *rhyton* and *figulina* ware on the other<sup>7</sup>.

The SCK complex may be regarded as one of the sources of what would become the LBK (Kaczanowska / Kozłowski 1994, 51; Pavúk 2004, 76), and also of the Vinča Culture in the Balkans (Raczky 1989; Horváth / Simon 2003, 238). These cultures emerged within the SCK area during the second half of the sixth millennium, and the latter has a few elements in common with Starčevo-Criş assemblages (e.g. figurines of the Late Starčevo and Early Vinča, Tasić 1973), although there are also many differences in pottery typology and technology (Leković 1990). What relationship existed between these cultures is still to be determined, however. From a typological and technological perspective they seem to be rather different (Spataro 2004-2005), suggesting an interruption in the normal processes of cultural transmission.

### Concluding thoughts

The new data provoke new thoughts on the Early Neolithic cultures in the Central Balkans. The ceramic analyses and other archaeological evidence indicate that these communities belonged to a coherent cultural complex, comprising both everyday material culture and the ideological-religious sphere such as common technological recipes for pottery production, symbolic items, and specific objects such as spoons. The radiocarbon dates show a very rapid expansion of this complex following the river courses from south to north, and from west to east or vice versa. The Neolithic settlements were occupied almost simultaneously, suggesting that the communities had a clear idea of what they were looking for: the most suitable areas for their new economy. The leapfrog colonisation theory stems from the lack of evidence of Mesolithic occupation in the study region and the speed with which the Neolithic spread across this apparently empty territory. It is therefore important to systematically survey areas within the Balkans to determine whether this gap in the archaeological record reflects a real absence of population in the Late Mesolithic, and to obtain more radiocarbon dates for the earliest Neolithic sites, particularly in Bulgaria, Macedonia, and Albania.

Looking at the wider picture, well-defined cultural boundaries between the SCK and the Vinča and LBK cultures, which begin later but are still contemporary with the later SC phases, suggest that the SCK was a very homogeneous cultural group. Despite the differences, however, we cannot deny that the earliest LBK sites appeared in the region occupied by SCK groups, which clearly suggests that some relationships must have existed between the two cultures (Kaczanowska / Kozłowski / Nowak 1997). Pottery from the earliest LBK sites in the Balkans should thus be studied to see whether there are any connections between this material and the contemporary SCK pottery. It is vital, if the relationship between these cultures is to be understood, that the absolute chronology of the end of the SCK complex and the beginning of the LBK and Vinča cultures be clarified by a systematic programme of radiocarbon dating.

The persistent differences between the SCK and the contemporary and neighbouring Impressed Ware Culture are equally interesting. To understand the significance of this cultural boundary, we need in particular to study materials from the zone where the two cultures apparently came into contact, for instance at Obre, in Bosnia and Herzegovina (Benac 1973), and from the earliest phases of each culture. If these cultures diverged from a common origin, where and when did this divergence take place, and why? All these questions remain to be investigated.



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## Annotations

- 1) The project was co-directed by Professors S. Shennan (Institute of Archaeology, UCL) and P. Biagi (Ca' Foscari University, Venice) and funded by the Leverhulme Trust.
- 2) One of these sites, Tomasica (HR), belongs to the Malo Korenovo Culture (Spataro 2004-2005), and is not discussed here.
- 3) Willis 1994; Willis / Bennett 1994; Kremenetski 1997; Feurdan 2005; Tantau et al. 2006.
- 4) Radiocarbon dated pollen diagrams from sites on the Black Sea coast of Bulgaria do show anthropogenic influences in the Early Neolithic (Bozilova et al. 1996), but diagrams from high-altitude sites in the interior do not indicate significant human impact until at least the Bronze Age (Willis 1994; Willis / Bennett 1994).
- 5) The *rhyton*, a four-legged vessel, with a large round or oval-shaped mouth, is probably a cult vessel, and is typical of the contemporary and neighbouring Impressed Ware Culture, which developed along the coastlines of the Adriatic (Biagi 2003; Montagnari Kokelj / Crismani 1993).
- 6) In Sindh (Pakistan) the potters are taught the craft of ceramic manufacture when they are children or very young by people belonging to the same caste. This craft is taught by practical demonstration and is orally transmitted. This is also true of the repetitive decorative motifs painted by women of the potter's household or from the same village (Spataro 2004a).
- 7) *Figulina* ware is a very fine pinkish or greyish pottery found at Impressed Ware sites on both coasts of the Adriatic and in the same area during the Middle Neolithic. Unlike ordinary Impressed Ware pottery, it appears to have been made by specialist potters using refined raw materials and fired at high temperatures in kilns (Spataro 2002, 190-191. 197).

## References

- Ammerman 2002: A. J. Ammerman, Returning to the Neolithic transition in Europe. In: E. Badal / J. Bernabeu / B. Martí (eds.), *Neolithic Landscapes of the Mediterranean*, Saguntum Extra-5, 2002, 13-21.
- Ammerman / Cavalli-Sforza 1971: A. J. Ammerman / L. L. Cavalli-Sforza, Measuring the rate of spread of early farming in Europe. *Man* 6, 1971, 674-688.
- Benac 1973: A. Benac, Obre I - A Neolithic settlement of the Starčevo-Impresso and Kakanj Cultures at Raskršće. *Wissenschaftliche Mitteilungen des Bosnisch-Herzegowinischen Landesmuseums III(A)* (Sarajevo 1973) 327-430.
- Biagi 2003: P. Biagi, The Rhyton of the Balkan Peninsula: Chronology, Origin, Dispersion and Function of a Neolithic »Cult« Vessel. *Journal of Prehistoric Religion* 16-17, 2003, 16-26.
- Biagi / Gratuze / Boucetta 2007: P. Biagi / B. Gratuze / S. Boucetta, New data on the archaeological obsidian of Transylvania and Banat. In: M. Spataro / P. Biagi (eds.) *A Short Walk Through the Balkans: the First Farmers of the Carpathian Basin and Adjacent Regions*. Società per la Preistoria e Protostoria della Regione Friuli-Venezia Giulia, Quaderno 12, 2007, 129-148.
- Biagi / Spataro 2002: P. Biagi / M. Spataro, The Mesolithic/Neolithic transition in north eastern Italy and in the Adriatic Basin. In: E. Badal / J. Bernabeu / B. Martí (eds.), *Neolithic Landscapes of the Mediterranean*, Saguntum Extra-5, 2002, 167-178.
- Biagi / Shennan / Spataro 2005: P. Biagi / S. Shennan / M. Spataro, Rapid Rivers and Slow Seas? New Data for the Radiocarbon Chronology of the Balkan Peninsula. In: L. Nikolova / J. Fritz / J. Higgins (eds.), *Prehistoric Archaeology & Anthropological Theory and Education*. Reports of Prehistoric Research Projects 6-7 (Salt Lake City / Karlovo) 43-51.
- Biró 2003: K. T. Biró, The Neolithic in the northern part of the Great Hungarian Plain and the northern mountain range. In: Z. Visy (ed.), *Hungarian Archaeology at the turn of the millennium* (Budapest 2003) 101.
- Bonsall et al. 2000: C. Bonsall / G. Cook / R. Lennon / D. Harkness / M. Scott / L. Bartosiewicz / K. McSweeney, Stable isotopes, radiocarbon and the Mesolithic-Neolithic transition in the Iron Gates. *Documenta Praehistorica* 27, 2000, 119-132.
- Borić / Miracle 2004: D. Borić / P. Miracle, Mesolithic and Neolithic (dis)continuities in the Danube Gorges: new AMS dates from

- Padina and Hajdučka Vodenica (Serbia). *Oxford Journal of Archaeology* 23(4), 2002, 341-371.
- Bozilova et al. 1996: E. Bozilova / M. Filipova / L. Filipovich / S. Tonkov, Bulgaria. In: B. E. Berglund / H. J. B. Birks / M. Ralska-Jasiewiczowa / H. E. Wright (eds.), *Palaeoecological Events During the last 15.000 Years: Regional Syntheses of Palaeoecological Studies of Lakes and Mires in Europe* (Chichester) 701-728.
- Bronk Ramsey 2001: C. Bronk Ramsey, Development of the radiocarbon calibration program OxCal. *Radiocarbon* 43, 2001, 355-363.
- Feurdan 2005: A. Feurdan, Holocene forest dynamics in north-western Romania. *The Holocene* 15(3), 2005, 435-446.
- Forenbaher / Miracle 2005: S. Forenbaher / P. Miracle, The spread of farming in the Eastern Adriatic. *Antiquity* 79 (305), 2005, 514-528.
- Guilaine 2003: J. Guilaine, Aspects de la Néolithisation en Méditerranée et en France. In: A. J. Ammerman / P. Biagi (eds.), *The Widening Harvest. The Neolithic Transition in Europe: Looking Back, Looking Forward. Proceedings of a conference held in Venice, Italy, Oct. 29-31, 1998. Colloquia and Conference Papers* 6 (Boston 2003) 189-206.
- Hazelwood / Steele 2004: L. Hazelwood / J. Steele, Spatial dynamics of human dispersals: constraints on modelling and archaeological detection. *Journal of Archaeological Science* 31, 2004, 669-679.
- Horváth / Simon 2003: L. A. Horváth / K. H. Simon, Das Neolithikum und die Kupferzeit in Südwesttransdanubien. *Inventaria Praehistorica Hungariae* 8 (Budapest 2003).
- Kaczanowska / Kozłowski 1994: M. Kaczanowska / J. K. Kozłowski, Environment and highland zone exploitation in the Western Carpathians (VII-VI Millennium BP). In: P. Biagi / J. Nandris (eds.), *Highland Zone Exploitation in Southern Europe. Monografie di Natura Bresciana* 20 (Brescia 1994) 49-71.
- Kaczanowska / Kozłowski / Nowak 1997: M. Kaczanowska / J. K. Kozłowski / M. Nowak, Conclusions In: J. K. Kozłowski (ed.), *The Early Linear Pottery Culture in Eastern Slovakia. Polska Akademia Umiejętności. Prace Komisji Prehistorii Karpat* 1 (Kraków 1997) 267-273.
- Karmanski 1978: S. Karmanski, Katalog antropomorfne idoloplastike I nalazi sa lokaliteta Mostonga I, II. *Arheološka Zbirka Pri Narodnom Univerzitetu* (Odžac 1978).
- 2005: S. Karmanski, Donja Branjevina: a Neolithic settlement near Deronje in the Vojvodina (Serbia). In: P. Biagi (ed.), *Società per la Preistoria e Protostoria della Regione Friuli-Venezia Giulia, Quaderno* 9 (Trieste 2005).
- Korkuti 2007: M. Korkuti, The early Neolithic of Albania in a Balkan perspective. In: M. Spataro / P. Biagi (eds.), *A Short Walk Through the Balkans: the First Farmers of the Carpathian Basin and Adjacent Regions. Società per la Preistoria e Protostoria della Regione Friuli-Venezia Giulia, Quaderno* 12, 2007, 113-117.
- Kozłowski / Nowak / Vizdal 2003: J. K. Kozłowski / M. Nowak / M. Vizdal, A settlement of the Early Eastern Linear pottery Culture at Moravany (Eastern Slovakia) within the context of the neolithisation of the Upper Tisza Basin. In: E. Jerem / P. Raczky (eds.), *Morgenrot der Kulturen. Frühe Etappen der Menschheitsgeschichte in Mittel- und Südosteuropa. Festschrift für Nándor Kalicz zum 75. Geburtstag. Archaeolingua* 15 (Budapest 2003) 127-143.
- Kremenetski 1997: C. V. Kremenetski, Human Impact on the Holocene vegetation of the South Russian Plain. In: J. Chapman / P. Dolukhanov (eds.), *Landscapes in Flux: Central and Eastern Europe in Antiquity. Colloquia Pontica* 3 (Oxford) 275-287.
- Lazarovici 1979: G. Lazarovici, Neoliticul Banatului. *Muzeul de Istorie al Transilvaniei. Bibliotheca Musei Napocensis* 4 (Cluj-Napoca 2003).
- 1993: G. Lazarovici, Les Carpates Méridionales et la Transylvanie. In: J. Kozłowski (ed.), *Atlas du Néolithique Européen, L'Europe Orientale* 1. ERAUL, 45 (Liège 1993) 243-284.
- Lazarovici / Maxim 1995: G. Lazarovici / Z. Maxim, Gura Baciului. *Monografie arheologică. Biblioteca Musei Napocensis* 9. (Cluj Napoca 1995).
- Leković 1990: V. Leković, The Vinčanization of Starčevo Culture. In: D. Srejović / N. Tasić (eds.), *Vinča and Its World. International Symposium The Danubian Region from 6000 to 3000 BC. Belgrade, Smederevska Palanka, October 1988. Serbian Academy of Sciences and Arts* (Belgrade 1990) 67-74.
- Lenneis / Lüning 2001: E. Lenneis / J. Lüning, Die ältestbandkeramischen Siedlungen von Neckenmarkt und Strögen. *Universitätsforschungen zur Prähistorischen Archäologie* 81 (Bonn 2001).
- Luca / Suci 2007: S. Luca / C. Suci, Migrations and local evolution in the Early Neolithic in Transylvania: typological-stylistic analysis and the radiocarbon data. In: M. Spataro / P. Biagi (eds.), *A Short Walk Through the Balkans: the First Farmers of the Carpathian Basin and Adjacent Regions. Società per la Preistoria e Protostoria della Regione Friuli-Venezia Giulia, Quaderno* 12, 2007, 77-87.
- Makkay 1992: J. Makkay, Excavations at the Körös Culture settlement of Endrőd-Öregszőlők 119 in 1986-1989. In: *Cultural and Landscape Changes in South-East Hungary I. Reports on the Gyomaendrőd Project. Archaeolingua* (Budapest 1992) 121-193.
- 1998: J. Makkay, I primi agricoltori dell'Europa sud-orientale e il Neolitico del Bacino dei Carpazi. In: A. Pessina / G. Muscio (eds.), *Settemila anni fa il primo pane. Ambienti e culture delle società neolitiche. Museo Friulano di Storia Naturale* (Udine 1998) 34-54.
- 2007: J. Makkay, The Excavations of the Early Neolithic sites of the Körös Valley, Hungary: the final report. Volume 1, the excavations: stratigraphy, structures and graves. E. Starnini / P. Biagi (eds.) *Società per la Preistoria e Protostoria della Regione Friuli-Venezia Giulia, Quaderno* 11 (Trieste 2007).
- Maxim 1999: Z. Maxim, Neo-Eneoliticul din Transilvania. *Bibliotheca Musei Napocensis* 19 (Cluj-Napoca 1999).
- Minichreiter 1992: K. Minichreiter, Starčevačka Kultura u Sjevernoj Hrvatskoj. *Dizertacije i Monografije* 1. *Arheološki Zavod Filozofskog Fakulteta Sveučilišta u Zagrebu* (Zagreb 1992).
- 2007: K. Minichreiter, The First Farmers of Northern Croatia. In: M. Spataro / P. Biagi (eds.), *A Short Walk Through the Balkans: the First Farmers of the Carpathian Basin and Adjacent Regions. Società per la Preistoria e Protostoria della Regione Friuli-Venezia Giulia, Quaderno* 12, 2007, 171-181.
- Mitrevski 2003: D. Mitrevski, D. Prehistory in Republic of Macedonia-F.Y.R.O.M. In: D. V. Gramenos (ed.), *Recent Research in the Prehistory of the Balkans. Publications of the Archaeological Institute of Northern Greece* 3 (Thessaloniki 2003) 13-72.
- Montagnari Kokelj / Crismani 1993: E. Montagnari Kokelj / A. Cris-

- mani, La presenza di »vasi a quattro gambe« nel neolitico del Carso Triestino. *Aquileia Nostra* 64, 1993, 10-66.
- Nandris 1971: J. Nandris, Bos primigenius and the bone spoon. *Bulletin of the Institute of Archaeology* 10, 1972, 63-82.
- Paul 1995: I. Paul, Vorgeschichtliche Untersuchungen in Siebenbürgen. *Bibliotheca Universitatis Apulensis* (Alba Iulia 1995).
- Păunescu 2001: A. Păunescu, Paleoliticul și Mezoliticul din Spațiul Transilvan. AGIR (Bucarest 2001).
- Pavúk 2004: J. Pavúk 2004, Early Linear Pottery Culture in Slovakia and the Neolithisation of Central Europe. In: A. Lukes / M. Zvelebil (eds.), *LBK Dialogues Studies in the formation of the Linear pottery Culture*. BAR International Series 1304 (Oxford 2004) 71-82.
- Pavúk / Cohadžiev 1984: J. Pavúk / M. Cohadžiev, Neolithische Tellsiedlung bei Gălâbnik in Westbulgarien. *Slovenská Archeologia* 32/1, 1984, 195-228.
- Perlès 2005: C. Perlès, From the Near East to Greece: Let's reverse the focus. Cultural elements that didn't transfer. In: C. Lichter (ed.), *How Did Farming reach Europe?* *BYZAS* 2, 2005, 275-290.
- Raczky 1989: P. Raczky, Chronological Framework of the Early and Middle Neolithic in the Tisza Region. In: S. Bökönyi (ed.), *Neolithic of Southeastern Europe and its Near Eastern Connections*. *Varia Archaeologica Hungarica* 2 (Budapest 1989) 233-251.
- Reimer et al. 2004: P. J. Reimer / M. G. L. Baillie / E. Bard / A. Bayliss / J. W. Beck / C. J. H. Bertrand / P. G. Blackwell / C. E. Buck / G. S. Burr / K. B. Cutler / P. E. Damon / R. L. Edwards / R. G. Fairbanks / M. Friedrich / T. P. Guilderson / A. G. Hogg / K. A. Hughen / B. Kromer / G. McCormac / S. Manning / C. Bronk Ramsey / R. W. Reimer / S. Remmele / J. R. Southon / M. Stuiver / S. Talamo / F. W. Taylor / J. van der Plicht / C. E. Weyhenmeyer, *IntCal04 Terrestrial radiocarbon age calibration, 0-26 Cal Kyr BP*. *Radiocarbon* 46, 2004, 1029-58.
- Spataro 2002: M. Spataro, The First Farming Communities of the Adriatic: Pottery Production and Circulation in the Early and Middle Neolithic. *Società per la Preistoria e Protostoria della Regione Friuli-Venezia Giulia*, Quaderno 9 (Trieste 2002).
- 2004a: M. Spataro, Pottery production in the Thar Desert (Sindh, Pakistan): three case-studies (Hindwari, Pir chebo, and Hingorja). *Rivista di Archeologia* 28, 2004, 171-180.
- 2004b: M. Spataro, Differences and similarities in the pottery production of the Early Neolithic Starčevo-Criș and Impressed Ware Cultures. *Rivista di Scienze Preistoriche* 54, 2004, 321-336.
- 2004-2005: M. Spataro, Pottery production at a Linear Pottery Culture site: a different ceramic technology from that of the Starčevo-Criș culture? A case-study: the site of Tomašica (Garešnica, HR). *Atti della Società per la Preistoria e Protostoria della regione Friuli-Venezia Giulia* 15, 2006, 117-134.
- 2006: M. Spataro, Pottery typology versus technological choices: an Early Neolithic case study from Banat (Romania). *Analele Banatului* 14, 2006, 63-77.
- 2007: M. Spataro, Everyday ceramics and cult objects: a millennium of cultural transmission. In: M. Spataro / P. Biagi (eds.), *A Short Walk Through the Balkans: the First Farmers of the Carpathian Basin and Adjacent Regions*. *Società per la Preistoria e Protostoria della Regione Friuli-Venezia Giulia*, Quaderno 12, 149-160.
- 2008: M. Spataro, Early Neolithic pottery production in Romania: the scientific analysis of the ceramics from Gura Bacului and Șeușa La-cărarea morii (Transylvania). In: D. W. Bailey / A. Whittle / D. Hofman (eds.), *Living Well Together? Settlement and Materiality in the Neolithic of South-East and Central Europe* (Oxford 2008) 91-100.
- in prep.: M. Spataro, Balkan Neolithic in Perspective: The Neolithisation of Southeastern Europe. *Società per la Preistoria e Protostoria della Regione Friuli-Venezia Giulia*, Quaderno 13 (in prep.).
- Srejović 1971: D. Srejović, Die Lepenski Vir-Kultur und der Beginn der Jungsteinzeit in der Mittleren Donau. In: H. Schwabedissen (ed.), *Die Anfänge des Neolithikums vom Orient bis Nordeuropa*, 2. *Fundamenta A* (3) (Köln-Wien 1971) 1-19.
- 1972: D. Srejović, Europe's First Monumental Sculpture: new discoveries at Lepenski Vir. (London 1972).
- Sűmegi 2003: P. Sűmegi, Early Neolithic man and riparian environment in the Carpathian Basin. In: E. Jerem / P. Raczky (eds.), *Morgenrot der Kulturen. Frühe Etappen der Menschheitsgeschichte in Mittel- und Südosteuropa*. *Festschrift für Nándor Kalicz zum 75. Geburtstag*. *Archaeolingua* 15 (Budapest 2003), 53-60.
- Tantau et al. 2006: I. Tantau / M. Reille / J. L. De Beaulieu / S. Farcas, Late Glacial and Holocene vegetation history in the southern part of Transylvania (Romania): pollen analysis of two sequences from Avrig. *Journal of Quaternary Science* 21(1), 2006, 49-61.
- Tasić 1973: N. Tasić, *Neolitska plastika* (Belgrade).
- Williams-Thorpe / Warren / Nandris 1984: O. Williams Thorpe / S. E. Warren / J. G. Nandris, The Distribution and provenance of archaeological obsidian in Central and Eastern Europe. *Journal of Archaeological Science* 11 (3), 1984, 183-212.
- Willis 1994: K. J. Willis, The vegetational history of the Balkans. *Quaternary Science Reviews* 13, 1994, 769-788.
- Willis / Bennett 1994: K. J. Willis / K. D. Bennett, The Neolithic transition - fact or fiction? Palaeoecological evidence from the Balkans. *The Holocene* 4 (3), 1994, 326-330.

### **Die Neolithisierung des Zentralen Balkan: Bocksprung-Diffusion und kulturelle Übermittlung**

Seit 2003 finden am Institute for Archaeology, University College London, naturwissenschaftliche Keramikanalysen statt, ebenso wird ein auf <sup>14</sup>C-Daten beruhendes Chronologiegerüst für achtzehn Starčevo-Criș (SC) Fundplätze im Zentralen Balkan aufgestellt, welche die vier Phasen dieser Kultur abdecken (Lazarovici 1993). Die Ergebnisse der Messungen zeigen, dass Fundplätze vom östlichen Transsylvanien bis Slavonien fast zeitgleich um etwa 6000 cal BC entstanden. Es gibt wenige Hinweise auf eine spätmesolithische Bevölkerung in dieser Region, so dass angenommen werden muss, dass die neolithische Bevölkerung aus dem Süden stammte. Neolithische Fundplätze liegen an den Hauptzuflüssen der Donau, nahe natürlicher Ressourcen wie Salz. Das Ausmaß der Diffusion kann nicht durch ein Bevölkerungswachstum erklärt werden, somit erscheint eine Ausbreitung im »Bocksprung«-System entlang der Hauptflusssysteme als wahrscheinlich (Biagi / Shennan / Spataro 2005). Die naturwissenschaftliche Analyse der Keramik zeigt, dass während der so genannten Phase SC IA/IC (Spataro 2008) im gesamten Gebiet eine einheitliche Tonzubereitungstechnologie genutzt wurde. Dies ist ein Beispiel für eine horizontale kulturelle Übermittlung bei der innerhalb einer Generation Ideen zwischen benachbarten Gemeinschaften verbreitet werden.

### **The neolithisation of the Central Balkans: Leapfrogging Diffusion and Cultural Transmission**

Research carried out at the Institute of Archaeology, University College London, since 2003 has focussed on the scientific analysis of pottery and the construction of a radiocarbon chronology for eighteen Starčevo-Criș (SC) sites in the Central Balkans, representing the four typological phases of this culture (Lazarovici 1993). The <sup>14</sup>C results show that sites from eastern Transylvania to Slavonia were occupied almost simultaneously at about 6000 cal BC. There is little Late Mesolithic evidence in this region, and it must be assumed that the Neolithic population originated from further south. Neolithic sites are located along major tributaries of the Danube, close to natural resources such as salt. The rate of diffusion, which cannot be explained by population growth, suggests »leapfrogging« along the river network (Biagi / Shennan / Spataro 2005). The scientific analyses of the ceramics show that a common formula was used throughout the region to produce ceramics in the so-called SC phase IA/IC (Spataro 2008). This is an example of horizontal cultural transmission in which ideas are spread between adjacent communities within a single generation.

### **La néolithisation du centre des Balkans : diffusion de type «leapfrog» et transmission culturelle**

Les recherches menées depuis 2003 par l'Institut d'Archéologie de l'University College London se sont attachées à l'analyse scientifique de la céramique et à l'élaboration d'une chronologie radiocarbone à partir de dix-huit sites Starčevo-Criș (SC) dans la région centre-balkanique qui représentent quatre phases typologiques de cette culture (Lazarovici 1993). Les résultats des mesures radiocarbone montrent que les sites entre l'est de la Transylvanie et la Slavonie ont été fondés au même moment autour de 6000 cal BC. Dans cette région, peu de traces du Mésolithique récent sont attestées et on peut supposer que le peuplement néolithique est originaire des régions situées plus au sud. Les sites néolithiques sont répartis le long des principaux affluents du Danube, à proximité de ressources naturelles comme le sel. Ne pouvant s'expliquer par une croissance démographique, ce taux de diffusion s'apparente à une diffusion de type «leapfrog» le long des axes fluviaux (Biagi / Shennan / Spataro 2005). Les analyses scientifiques de la céramique montrent que la céramique de la phase IA/IC des sites Starčevo-Criș a été façonnée selon un procédé commun à toute la région (Spataro 2008). Il s'agit d'un exemple de transmission culturelle horizontale où les idées sont véhiculées entre communautés voisines en l'espace d'une seule génération.

(traduit de l'anglais par Karoline Mazurié de Keroualin)

# NEUERSCHEINUNGEN

M. Street · N. Barton · Th. Terberger (eds)

## Humans, Environment and Chronology of the Late Glacial of the North European Plain

Proceedings of Workshop 14 (Commission XXXII) of the 15<sup>th</sup> U.I.S.P.P. Congress, Lisbon, September 2006

The volume »Humans, Environment and Chronology of the Late Glacial of the North European Plain« assembles papers presented during a workshop for the 15<sup>th</sup> Congress of the »Union International des Sciences Préhistoriques et Protohistoriques« held in Lisbon in September 2006. The workshop was organised under the remit of U.I.S.P.P. Commission XXXII which focuses on the »The Final Palaeolithic of the Great European Plain«, and the present volume continues the series of conference proceedings that have been published at regular intervals during the past decade. This most recent contribution underlines the geographical spread and chronological depth of research into this topic, with papers ranging from those on the British Isles to the eastern Baltic and from the Paris Basin to southern Scandinavia, and covering a period of time extending from the late Magdalenian to the early Mesolithic.

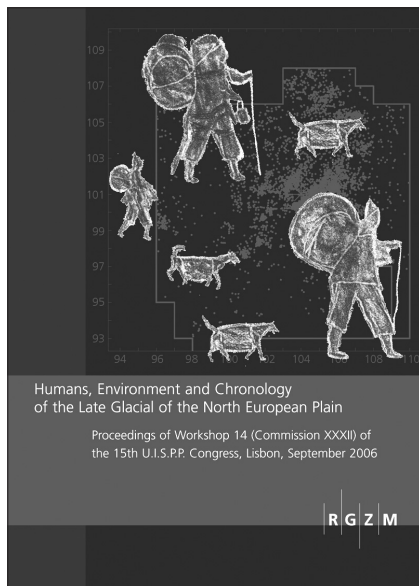
Thomas Zimmermann

## Die ältesten kupferzeitlichen Bestattungen mit Dolchbeigabe

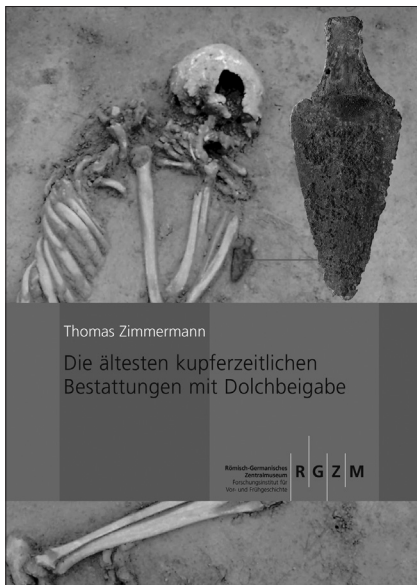
Archäologische Untersuchungen in ausgewählten Modellregionen Alteuropas

In vorgeschichtlicher Zeit nimmt der Dolch eine hervorgehobene Stellung innerhalb der Nahkampfaffen ein, deren älteste datierbare Vorformen in Vorderasien bis in das 9. Jahrtausend v.Chr. zurückreichen. Ab der zweiten Hälfte des 3. Jahrtausends v.Chr. spielt der Dolch schließlich im Rahmen der endneolithisch/kupferzeitlichen »Glockenbecherepoche« (Mitte 3. Jahrtausend v.Chr.) im Vorfeld der »klassischen« Frühbronzezeit (spätes 3. und frühes 2. Jahrtausend v.Chr.) eine zentrale Rolle beim Grabritus.

Diese Studie erfasst und analysiert geschlossene Einzelgrabbefunde Mitteleuropas mit Silex- oder Metaldolchbeigabe des 3. Jahrtausends v.Chr. Um sich dem Problemkomplex umfänglich zu nähern, werden auch die frühesten Belege zweischneidiger Stichwaffen Ost- und Südosteuropas, Westkleinasiens sowie dem prädynastischen Ägypten in ihrem grabrituellen Umfeld mit berücksichtigt. Neben der Diskussion chronologischer Aspekte dieser Bewaffnungssitte steht die Frage nach der Genese und Verbreitung formaler und technologischer Traditionen der Dolche im Zentrum. Dies führt zu sozialgeschichtlichen Überlegungen, inwiefern der Dolch generell als statusbildendes Zubehör verstanden werden darf.



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Mit der Entdeckung des Mannes im Eis 1991 wurde die Geschichte der Archäologie um eine bemerkenswerte Episode reicher. Selten gelang es, eine derart große Forschergemeinschaft weltweit zu bündeln, um den Fundkomplex zu ergründen. Noch 18 Jahre später beschäftigen sich Medizin, Natur- und Geisteswissenschaft mit dem Schicksal eines Mannes, der vor 5300 Jahren in den Ötztaler Alpen einen gewaltsamen Tod erlitten hat. Auch das archäologische Programm lässt noch viele Wünsche offen. So gesehen ist die Edition des vorliegenden Bands von Markus Egg und Konrad Spindler, der die umfassende Vorlage der Ausrüstung und Kleidung beinhaltet, eine ungemein wichtige und vertiefende Ergänzung zu den bisher getroffenen archäologischen Aussagen.



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## Aufstieg und Untergang – Zwischenbilanz des Forschungs- schwerpunktes Eliten

Seit einigen Jahren besteht am RGZM der Forschungsschwerpunkt »Eliten«. Hier wird besonders das Phänomen der Prunkgräber untersucht. In einer Zwischenbilanz werden nun vor allem die Bereiche der Metallzeiten und des frühen Mittelalters vorgelegt. Die Studien erlauben, Entwicklungen aufzuzeigen und somit die Frage nach dem »Aufstieg und Untergang« zu diskutieren. Es zeigt sich dabei ein facettenreiches Bild, doch werden auch »Konstanten« erkennbar. Sie deuten an, dass Macht schon in vor- und frühgeschichtlichen Gesellschaften auf vier wesentlichen Säulen ruhte: einer ökonomischen, sozialen, religiösen und militärischen.

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