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Introduction

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Introduction

Clive Bonsall, Vasile Boroneanț & Ivana Radovanović

This book had its origins in a symposium held at the University of Edinburgh from 30 March to 2 April 2000, which was attended by 54 archaeologists with a shared interest in the prehistory of the small but distinctive region of Southeast Europe known as the Iron Gates (Fig. 1). It is by no means a complete compilation of the papers delivered at the symposium. Some contributions dealt with aspects of the Romanian–British excavations at Schela Cladovei, and will form the basis of a separate publication. Moreover, of the 15 articles included in the present volume, only ten are based on papers presented at the Edinburgh meeting, while five — those by Dragana Antonović, Vesna Dimitrijević, Joni Manson, László Bartosiewicz *et al.*, and Clive Bonsall *et al.* — are later additions.

As a geographical label, the term 'Iron Gates' has acquired several different meanings.¹ In the broad sense it refers to the section of the Danube valley where the river forms the modern political border between Serbia and Romania, and it is this definition we have adopted for the present volume. The 230 km long Iron Gates section marks the beginning of the Lower Danube. It divides naturally into two linear zones —

the Iron Gates 'gorge' (Fig. 2) and the 'downstream area' (Fig. 3). The gorge, really a series of narrow, steep-sided canyons separated by sections where the valley is wider and the sides less steep, cuts a winding course for 134 km between the southern Carpathian Mountains and the northwestern foothills of the Balkan Mountains. In Serbia the gorge is known as Đerdap (from the Turkish 'girdap' meaning whirlpool — literally, 'gorge of whirlpools') reflecting the former presence of several sets of rapids and the generally turbulent flow of the river along this stretch of the Danube. In contrast, the downstream area is a zone of much more moderate relief, marking the beginning of the Danube's journey across the Wallachian Plain toward the Black Sea. Here the river is flanked by a broad alluvial plain comprising a series of terraces. Notwithstanding the differences in topography, microclimates and natural vegetation between the two zones, the 'gorge' and the 'downstream area' have many features in common archaeologically.

The Danube is both an important route way and a natural barrier, and historically the Iron Gates has had great strategic importance. The region is exceptionally rich in sites dating to



Figure 1. Principal Mesolithic and Early Neolithic sites of the Iron Gates.

the Roman and later periods, especially military installations. Roman achievements in the Iron Gates include forts, a canal built to bypass the rapids at the lower end of the gorge, and Trajan's Bridge constructed in AD 103–105 to supply Roman legions during the Second Dacian War.

While there is a long tradition of Roman archaeology in the Iron Gates extending back more than a century, the prehistory of the region was virtually unknown until the second half of the twentieth century when the first systematic archaeological surveys were undertaken in advance of the impounding of the Danube by the Iron Gates I and II dams. The survey work and rescue excavations were concentrated in the parts of the valley that would eventually be submerged beneath the reservoirs created by the two dams - essentially a narrow zone along both banks of the Danube as well as some low-lying islands in the river. The fieldwork progressed in two phases. The first between 1960 and 1971 focused on the areas affected by the Iron Gates I dam; these were very largely within the gorge, although some work was undertaken in the immediately downstream area at Ostrovul Banului and Schela Cladovei. In the second phase between 1977 and 1984 fieldwork was concentrated in the downstream area between the Iron Gates I and II dams.

Altogether, over two hundred archaeological sites of various periods were discovered. Among them were a number of Mesolithic sites, the first to be identified in the entire central Balkan region (Fig. 1). Excavations were undertaken at many of these sites — seven on the Serbian bank (Padina, Stubica, Lepenski Vir, Vlasac, Hajdučka Vodenica, Velesnica, and Kula) and 16 on the Romanian side (Privod, Alibeg, Vodneac, Ilișova, Cuina Turcului, Climente I and II, Veterani Cave, Veterani Terrace, Răzvrata, Icoana, Ostrovul Banului, Schela Cladovei, Ostrovul Corbului, and Ostrovul Mare km 875 and km 873). Some were major projects extending over several field seasons, but many were small, exploratory excavations lasting just a few days or weeks, and some of these were never completed, being abandoned when the level of the Danube became too high. The published record of these excavations is variable. Comprehensive reports are available for just two sites - Vlasac (Srejović & Letica 1978) and Cuina Turcului (Păunescu 1970, 1978). But there are many other publications that offer either interim excavation reports or studies of particular bodies of material, especially from Lepenski Vir, Padina, Hajdučka Vodenica, and Schela Cladovei. There have also been several attempts to provide regional syntheses, most notably by Radovanović (1996), Boroneant (2000), and Bonsall (2008).

Although a number of important Bronze and Iron Age sites were also discovered, it is the Mesolithic that has tended to dominate the literature on the Iron Gates in Prehistory and it is a recurrent theme throughout the present volume. The reasons are not hard to identify; the range and quality of the evidence from the Iron Gates relating to Mesolithic architecture, art, burial practices, bone and stone technology, and subsistence patterns, far exceeds that from any other region of Southeast or Central Europe west of the Black Sea. Moreover, some Mesolithic sites continued to be used into the Early Neolithic, making the Iron Gates an area of critical importance for understanding the processes involved in the transition from hunting and gathering to farming in Europe.

Since the completion of the dam projects (and the consequent 'loss' of many of the valley floor sites recorded in the 1960s to 1980s) the emphasis in research has shifted, although the focus has remained firmly on the Mesolithic and the Neolithic transition. While some fieldwork has continued along the banks of the Danube, notably at Schela Cladovei in Romania (Boroneant et al. 1999; Bonsall 2008) and Vlasac in Serbia (Borić 2007), many publications have been based on re-analyses of existing archaeological collections, taking advantage of advances in archeological science such as AMS ¹⁴C dating (e.g. Cook et al. 2002; Bonsall et al. 2004; Borić & Miracle 2004; Borić & Dimitrijević 2007), stable isotope analysis (e.g. Bonsall et al. 1997, 2000; Grupe et al. 2003), and techniques for the recovery of DNA from animal and human bones (e.g. Larson et al. 2007). The data generated by these new analyses in turn have permitted archaeologists to reassess the models of prehistoric settlement that were proposed on the basis of initial field observations. The papers that make up this volume exemplify both strands of this new phase of research.

Objectives and organization of the volume

The objectives of this volume are broadly those of the original Edinburgh symposium. First and foremost the volume is intended to illustrate the immense research potential of the Iron Gates region, even though those areas along the Danube's banks that proved attractive for prehistoric settlement are now largely flooded and there has been comparatively little additional fieldwork undertaken since the mid-1980s. A second objective is to provide case studies that illustrate the nature of current research and the rich possibilities offered by the growing range of scientific techniques available to archaeologists and their application to existing archaeological collections.

When editing the volume it soon became evident that there was considerable overlap between the papers in terms of chronological and/or geographical coverage, or theoretical and/or methodological emphasis. Therefore, we decided on a basic division between those papers that include an element of regional synthesis, and those that deal largely or exclusively with the evidence from an individual site:

Regional studies

This section begins with the paper by **Dušan Mihailović**, which focuses on the Late Glacial (Final Palaeolithic) and the Early Holocene (Early Mesolithic) in the Iron Gates. Mihailović identifies clear trends in settlement pattern, subsistence and technology during this time range, including a reduction in the size of annual territories, increased use of local resources, and a decline in the range and quality of chipped stone artefacts. He argues that these perceived trends reflect a reduction in residential mobility in response to changing environmental conditions and resource availability.

While the technological emphasis in Dusan Mihailović's paper is on chipped stone artefacts, **Dragana Antonović** reviews the evidence for a ground stone industry in the Iron Gates and its development during the Mesolithic and Early Neolithic. Assigned to the category of 'ground stone arte-



Figure 2. Two views of the Iron Gates gorge. Top: The gorge near the sites of Hajdučka Vodenica (Serbia) and Icoana (Romania); the photograph was taken from the Serbian bank looking upriver (© Mirjana Roksandic, 2000). Bottom: The gorge photographed from Lepenski Vir, looking upriver (© Ivana Radovanović, 2008).

facts' are "all stone implements worked by grinding/polishing, as well as unfinished examples with traces of flaking or pecking ... [and] ... implements that are naturally polished or polished through use" (Antonović, this volume: 19). Her analysis is restricted to sites on the Serbian bank of the Danube — proceeding downstream, Padina, Lepenski Vir, Vlasac, Hajdučka Vodenica, Ajmana, Velesnica, Knjepište, and Ušće Kameničkog Potoka. Within the ground stone industry she recognizes two major components, local and 'imported'. These are distinguishable not only in terms of typology and technique, but also raw material choices and ascribed function. The local component is seen to have developed independently within the Iron Gates region and comprises a wide range of tool forms including



Figure 3. Two views of the 'downstream area' of the Iron Gates. Top: The Danube floodplain at Schela Cladovei (Romania), 8 km downstream from the Iron Gates I dam. The Schela Cladovei archaeological site extends for about a kilometre along the riverbank. The town of Kladovo in Serbia can be seen on the opposite bank of the Danube (© Clive Bonsall, 2008). Bottom: The confluence of the Zamna river with the Danube on the Serbian side, 8 km upstream from the Iron Gates II dam. Opposite the confluence lies Ostrovul Mare (The Big Island). Several Mesolithic sites were found in the vicinity — cf. Figure 3 (© Ivana Radovanović, 2008).

various kinds of grinding tools, percussive instruments, weights, and ornamental artefacts, invariably made from locally available raw materials. The 'imported' component comprises mainly ground edge implements (axes, adzes, and chisels), which have clear parallels in the Starčevo and Vinča cultures of the central Balkans, and the materials are both local and imported. This, and the fact that both the local and 'imported' elements are found together in some sites, leads Antonović to the conclusion that the 'imported' element was an adopted technology. Her paper is both an important contribution to knowledge of the Iron Gates in Prehistory, and a valuable demonstration that ground stone tools (in the broad sense of non-chipped stone tools) were an important, and often abundant, component of Mesolithic and Neolithic sites throughout the Iron Gates. This is equally true of the Romanian bank of the Danube, although there they appear not to have been collected so systematically.

Somewhat broader in its chronological and geographical scope is the paper by László Bartosiewicz, Clive Bonsall & Vasile Şişu, which provides an overview of the zooarchaeological and ethnohistorical evidence for sturgeon fishing along the middle and lower Danube as represented by two contrasting sections of the river, in the Carpathian Basin and the Iron Gates. The exploitation of migratory sturgeon is documented from the Late Glacial onwards, although interpretation of the osteoarchaeological evidence is rarely straightforward. The authors attempt to provide a framework for future investigations, highlighting the many variables that archaeologists need to consider when seeking to interpret the role of sturgeon fishing in the lives of prehistoric peoples living along the Danube. These include sturgeon biology and behaviour, taphonomy, river conditions, fishing techniques, as well as local beliefs and customs.

papers focus on the effects of the Two Mesolithic-Neolithic transition in the Iron Gates region, and specifically the issue of population change. Both use data gathered by Mirjana Roksandic for her PhD study of the skeletal populations from four sites in the Serbian part of the Iron Gates — Hajdučka Vodenica, Lepenski Vir, Padina, and Vlasac (Roksandic 1999). Mirjana Roksandic's first paper in this volume examines the incidence of selected skeletal non-metric traits among the populations from different time periods and, based on the assumption that the traits are linked to ancestry, uses the data as a measure of the degree of interaction between local foragers and non-local farmers.² The 259 adult skeletons examined are divided into three chronological groups (Mesolithic, Mesolithic-Neolithic 'Contact' period, and Neolithic), and the groups compared. The results are interpreted as reflecting a substantial degree of population continuity between Mesolithic and Neolithic. It is suggested there may have been some 'seeping in' of immigrants during the contact period before the establishment of a farming economy in the Iron Gates, but evidence of population replacement at the transition is lacking. From this the author concludes that the Iron Gates Neolithic was primarily the result of local adoption. The paper by Mary Jackes, Mirjana Roksandic & Christopher Meiklejohn applies standardized palaeodemographic methods of analysis to Roksandic's age/sex data for skeletal populations from the Iron Gates, in order to test for changes in fertility across the Mesolithic–Neolithic transition. Whilst stressing that their interpretations are severely constrained by inadequate sample sizes and uncertainty over the dating of many skeletons, the authors offer the tentative conclusion that population levels in the Iron Gates were stable during the Mesolithic with an increase in fertility in the Neolithic, which is consistent with findings elsewhere in Europe.

The last two papers in this section are concerned with specific aspects of the Early Neolithic in the wider region of the central-northern Balkans. Joni Manson discusses the chronology of the Starčevo culture. Several chronological frameworks are in current use, all of which rely on pottery typology. But none of these has been adequately tested by independent dating procedures. Most attempts to establish the typological sequence of stylistic change in Starčevo ceramics have relied on stratigraphy and/or 14C dating of associated organic materials. A complementary approach would be to use the pottery itself to obtain direct age measurements, since there are more assumptions involved in ¹⁴C dating of material found near pottery than in trying to date the pottery directly (Bonsall et al. 2002). In a pioneering study based on her PhD research (Manson 1990), Dr Manson describes the results of archaeomagnetic intensity dating of potsherds from 12 Starčevo sites. By combining these data with Arandelović-Garašanin's (1954) typological sequence and the available radiocarbon dates for Starčevo sites, she is able to propose a revised chronology of the Starčevo culture.

In the following paper, Haskel Greenfield reviews the state of archaeozoological research in the central Balkans pertaining to the Early Neolithic. He points out that there are relatively few Early Neolithic sites with analyzed faunal assemblages, and the quality of the information from those sites is highly variable. Greenfield's discussion ranges over issues such as the effects of site location, sample size and taxonomic diversity, taphonomy, recovery methodology, quantification methods, curation, and state of publication, leading to the conclusion that the majority of faunal assemblages from the region have only limited potential for reconstructing animal exploitation strategies and land use patterns in the Early Neolithic. Greenfield's paper serves as both a warning of the fragility of conclusions based on existing archaeozoological reports, and a plea for a more rigorous approach to the analysis of Early Neolithic animal bone assemblages from Southeast Europe.

Site studies

Of the six papers that deal with individual sites, four focus on Lepenski Vir, arguably the most famous archaeological site in the Iron Gates region. All four papers present the results of new analyses of the finds from Dragoslav Srejović's excavation between 1965 and 1971. Not all of the finds survive from those excavations and this applies particularly to the animal remains, which in any case were mainly hand-collected (relatively little sieving was undertaken at Lepenski Vir). **Vesna Dimitrijević** focuses on the small surviving collection of animal bones stored in the National Museum in Belgrade, and specifically those recovered from within the famous trapezoidal buildings. In a thought-provoking analysis she distinguishes between remains deposited while a building was in use, and those deposited when it was abandoned. In so doing she identifies episodes of food preparation, bone manufacturing, and ritual deposition. Consideration is also given to the question of seasonality of building abandonment, although the evidence is limited.

The other papers focus on Lepenski Vir are concerned primarily with the human remains from the site. An unusual feature of Lepenski Vir was the occurrence of the remains of neonates underneath the floors of the trapezoidal buildings or immediately to the rear of the buildings. The papers by Sofija Stefanović & Dusan Borić and Biljana Čjulković, Sofija Stefanović & Stanka Romac are both directly concerned with these remains. Stefanović & Borić provide a detailed osteoarchaeological evaluation of the burials, including a discussion of taphonomy, supported by plans and photographs many of which have not been published previously. This leads on to a wide-ranging and thought-provoking discussion of the possible chronological and social significance of the neonate burials, which draws inspiration from archaeological, ethnographic, and ethnohistorical sources. Knowledge of the sex of the infants is fundamental to the interpretation of the burial evidence. However, determining the sex of neonate skeletons using standard osteometric procedures is notoriously unreliable. An alternative approach is to use ancient (aDNA) techniques. Čuljković et al. have done just this. Of the 41 infant skeletons excavated from under buildings, 30 individuals were tested and successful sex identification is reported in nearly all cases. These results have important implications for the related study by Stefanović & Borić, and thus the two papers should be considered together. Although by no means the first successful amplification of aDNA from ancient human remains, Čuljković et al.'s paper stands as a pioneering study for the Iron Gates and demonstrates the potential of the Iron Gates sites for archaeogenetic research.

The burial record from Lepenski Vir is not, of course, confined to neonates; there were also many burials of older children, adolescents, and adults, and these are the subject of the paper by Clive Bonsall, Ivana Radovanović, Mirjana Roksandic, Gordon Cook, Thomas Higham & Catriona Pickard. AMS ¹⁴C dates and stable isotope values are presented for 24 burials. The data are then used to establish the chronological contexts of different forms of burial represented at Lepenski Vir, and to refine the dating of the trapezoidal buildings where these occur in a clear stratigraphic relationship with directly dated burials. The authors suggest that their data also have implications for dating the appearance of farming in the Lepenski Vir catchment, although they acknowledge that this is a controversial subject, which is further complicated by curatorial problems and a lack precision in the ¹⁴C dates.

Three other papers in this section are concerned with sites downriver of Lepenski Vir. **Haskel Greenfield** provides an account of the (hitherto unpublished) animal bone assemblages from Late Mesolithic and Early Neolithic contexts at the site of Hajdučka Vodenica in the gorge, excavated by Borislav Jovanović between 1966 and 1969. In interpreting the results, Greenfield takes into account excavation methodology, uncertainties over stratigraphy, and the extent of taphonomic loss, in keeping with the approach advocated in his other contribution to this volume (pp. 103–114). Comparisons are made with other sites in the Iron Gates gorge. A key finding is that bones of apparently domestic cattle and pig occur in both the Mesolithic and Neolithic samples which begs the important question, is this evidence of Mesolithic animal domestication, exchange with farmers, or 'stratigraphic mixing'?

The important site of Velesnica in the downstream area is the focus of separate but related papers by Rastko Vasić and Mirjana Roksandic. Excavated by Rastko Vasić between 1980 and 1984, Velesnica is a multi-period open-air site on the Serbian bank of the Danube (Fig. 1). Vasić reviews the evidence from the main settlement phases. The most abundant remains belong to the Early Neolithic (Starčevo culture) and include three graves, one of which contained seven skeletons; the burials are discussed in more detail in the companion paper by Mirjana Roksandic. Vasić draws attention to several features of the Starčevo settlement at Velesnica that he believes demonstrate a cultural connection with Lepenski Vir and other Late Mesolithic/Early Neolithic sites in the gorge, including the presence of carved stone 'altars'. An earlier, Mesolithic occupation is suspected at Velesnica but could not be distinguished stratigraphically and has yet to be confirmed by radiocarbon dating.

The final paper in the volume, by Paolo Biagi, Elisabetta Starnini & Barbara Voytek, stands apart in that it does not deal with the Iron Gates per se. Their article reviews the evidence from Edera Cave on the karst plateau at the head of the Adriatic Sea, which has a long occupation sequence including Mesolithic and Neolithic deposits. It is included here because it touches on the question of Mesolithic 'survival' and contact between hunter-gatherers and farmers - still a major point of controversy among prehistorians working in the Iron Gates, with differing views aired by, e.g., Voytek & Tringham (1989), Radovanović & Voytek (1997), Tringham (2000), Borić (2002), Radovanović (2006), and Bonsall (2007, 2008). The co-occurrence of pottery, wild and domestic fauna, and chipped stone artefacts of Mesolithic character in 'layer 3a' at Edera is reminiscent of the situation described for some sites in the Iron Gates and evokes similar questions regarding the nature and timing of the transition from Mesolithic to Neolithic.

This volume presents new information and new perspectives on the prehistoric settlement of the Iron Gates. We also hope that it points out directions for future research. Many areas of uncertainty and controversy remain, and we look forward to further investments in AMS radiocarbon dating, isotopic analysis, and aDNA research in the future to help resolve some of these issues. In the years ahead we would also hope to see an extension of fieldwork into the hinterland on both sides of the Danube, beyond the areas affected by dam construction, in order to achieve a more representative picture of the human use of the Iron Gates in Prehistory.

Notes

 The original 'Iron Gate' of the Danube was the cliffs on either side of the rapids at the lower end of the gorge, where subsequently the Iron Gates I dam was built. In the Danube Convention of 1948 the term 'Iron Gates' was formally applied to "the section between Vince and Kostol on the right bank and between Moldova-Veche and Turnu-Severin on the left bank of the Danube", which includes most of the gorge and the first 8 km of the downstream area. A second dam was constructed 80 km downstream from Iron Gates I and given the official name 'Iron Gates II', thus effectively extending the term 'Iron Gates' to more or less the whole of the border region between Serbia and Romania.

2. The term 'non-metric trait', or 'discrete trait', refers to any minor (non-pathological) anomaly observed in bones and teeth that is not normally recorded by measurement. Non-metric traits may be recorded as being either present or absent or, less often, scored according to their degree of development (Mays 1998: 102).

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