

Violence in the Mesolithic

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ABSTRACT – *The Mesolithic populations of the Danube's Iron Gates Gorge (Serbia/Romania) spanned over 1500 years (from before 7000 BC to around 5500 BC) in one of the more favorable foraging environments of Europe. Over most of this period, the dominant economy was foraging, but farming was practiced by communities in the region from around 6500 BC. This research examines individuals from four sites on the Danube (Lepenski Vir, Vlasac, Padina, and Hajdučka Vodenica) whose traumatic lesions can be most plausibly interpreted as resulting from violent interactions. Given the number of individuals buried at these sites (MNI = 418), the episodes of violent interactions were few and without evidence of a specific temporal pattern. They probably represent sporadic episodes of interpersonal conflict that do not support the notion of endemic warfare deemed typical of the Mesolithic, or elevated levels of interpersonal/intertribal conflict at the time of contact with farming communities. The difference in the pattern of violence between the Mesolithic sites on the right bank of the Danube and a coeval site of Schela Cladovei on the left bank is explained in terms of differences in archaeological context, geographic location and possibly specific local histories.*

IZVLEČEK – *Mezolitike populacije so na področju donavske soteske Železna vrata (Srbija/Romunija) živele več kot 1500 let (pred 7000 BC do okoli 5500 BC) v enem izmed bolj ugodnih okolij za nabiralništvo v Evropi. Večino tega časa je bilo nabiralništvo dominantna ekonomija. S poljedelstvom so se skupine v tej regiji začele ukvarjati od približno 6500 BC dalje. Ta raziskava preiskuje osebe iz štirih najdišč ob Donavi (Lepenski Vir, Vlasac, Padina in Hajdučka Vodenica), katerih travmatične poškodbe so najverjetneje posledica nasilnih interakcij. Če upoštevamo število oseb, ki so pokopani na teh najdiščih (MNI = 418), so bila ta dejanja redka, pa dokazov o določenem časovnem vzorcu ni. Verjetno predstavljajo občasne konflikte. Vzorec ne podpira predstave o lokalnem vojskovanju, ki naj bilo značilnost mezolitika, ne medosebnih/medplemenskih konfliktov v času kontaktov s poljedelskimi skupnostmi. Drugačen vzorec nasilja med mezolitskimi najdišči na desnem bregu Donave in sočasnim najdiščem Schela Cladovei na levem bregu pojasnjujemo z razlikami v arheološkem kontekstu, geografski legi in morda specifični lokalni zgodovini.*

KEY WORDS – *prehistoric violence; prehistoric trauma; Mesolithic/Neolithic transition*

Anthropological approaches to warfare

After the relative neglect of warfare and violence in anthropology, there has been a revival of interest in theoretical questions regarding violent interactions in present-day small-scale societies and in archaeological populations. Recent editions – such as Reyna and Downs' series *War and Society* (in 5 volumes, from 1992 to 1998), Haas (1990) *Anthropology of War*, Ferguson's (1984) *Warfare, Culture and Environment*, to mention a few – confirm the growing interest in questions of war and warfare and the

theoretical bases for understanding war and its impact on developing structures within societies. Walker (Walker 2001) laments the lack of significant contributions to the study of violence by anthropologists, as opposed to the importance it has for historians. Nevertheless, books like Kelly's (2000) *Warless Societies and the Origin of War*, Guilaine and Zammit's (2001) *Le sentier de la Guerre*, Carman and Harding's (1999) *Ancient Warfare*, and Keeley's (1996) *War before Civilization* – with their emphasis

on understanding early prehistoric evidence – stem from an interest in discerning the predominance of violent interactions in the past that might help explain one of the most common, but perhaps undesirable, modes of human social behavior.

Warfare has always been part of the explanatory mechanism for the archaeological record and has been invoked in interpreting a number of structures, arms, evidence of village burning, and evidence of multiple deaths. What is perhaps new in this recent attitude towards the study of past warfare is the quest for its origins, for an interpretation of its roots in human societies. The focus on non-state societies, whether contemporary or prehistoric, seems to represent a logical choice in such explanatory attempts. The evidence gathered from present-day indigenous people practicing traditional ways of life, as well as historical accounts of such people, still provides the most immediate insight into the diversity of human responses. This evidence must be paramount. Considering these societies as pristine is passé (to use Reyna's word: 1994a.xiii), and only very few anthropologists would claim that they afford "an intimate glimpse beyond history" (Chagnon 1977.xii). Direct ethnographic analogy is often misleading, as it takes evidence out of its historical context. The recognition that these groups have their own history has to be the basic premise of all theory building and explanatory attempts (Ferguson 1992; Marshall Thomas 1994). "Wars are often fought locally, even world wars: they are conjunctural events" (Simons 1999.92). This local and historical character has to be kept in mind in all attempts to understand war and its background. Haas (1999) has stated that we can only begin to understand the origins of war by identifying repeating patterns of warfare in pre-state societies. Keeley shows that warfare is present in the archaeological record of non-state societies, and he demonstrates (1996.175) that pre-state society warfare cannot be regarded as different in extent and lethality from wars between states. Nevertheless, Haas questions Keeley's contention that warfare is universal and a given, and notes that Keeley "forces us to examine the critical question of why warfare appears and disappears at different times and places" (Haas 1999.13). Whether analyzing the causes of war in human society in general, or searching for similar patterns and causes on a regional level, it is crucial to take an historical approach to warfare from its emergence to its resolution. That an historical approach is crucial for archaeological interpretation is also stressed by ethnographic research (Ember and Ember 1997; Ferguson 1992), which shows

that all present-day small-scale societies have to be seen in the context of their interactions with state societies and the global economy.

There is no doubt that almost every human being is capable of violent behavior. Socialization and learning help to direct and channel this type of behavior. In any given group, certain kinds will be praised, others shunned. Individuals in a given group have to find the modality that will meet both individual needs and social expectations in a particular situation, including violence. However, societies differ both in the amount and direction of violent behavior that is considered permissible or appropriate. Furthermore, war is "not related to violence as simply more of the same" (Kelly 2000.21). This brings us to an important question in studying war: Can all violence be interpreted as warfare? When interpersonal violence in a studied group is rampant and involves more than one group perceived as a more or less coherent unit, do we need to distinguish between warfare and feuding? And even more importantly, how do we distinguish between them in the archaeological record? If we decide that warfare does not appear before a certain level of socio-political complexity (such as the state) within any society is reached (Reyna 1994b), then all of the violence experienced by non-state organized groups remains in the domain of "resolution of individual personal grudges" (Reyna 1994a). If we conceptualize war as restricted to centralized polities (Reyna 1994a.xiv), the question of warfare in the Mesolithic does not even arise.

Definitions of warfare

The definition of warfare which Reyna offers is based on its proximate (stated and real) causes, and he resorts to a 'grudge-accumulation process' as an explanatory mechanism for the protracted tribal fighting in which members of villages became involved in raids and battles (Reyna 1994b.42). But can we really emphasize causal factors as the determinant in our definition of warfare; and which cause do we consider: an immediate proximate cause, or an underlying one? It is more than obvious that the proclaimed causes that have prompted states to declare war have rarely been anything more than propaganda tools aimed at the domestic population, the people who are required to accept and support the war. The motives of the society (or rather its elite) are usually well hidden behind ideological proclamations aimed not so much at the enemy or future historians, but at its own population whose dissent

has to be prevented. Repetition Thus Keeley (1996: 114) asks: “Should any motive declared by anyone be considered? Should motives be inferred from the operation, results, and effects of specific wars or acts of war?” (Emphasis L. K.). The predominant motives for pre-state warfare (based on cross-cultural studies as reported in Keeley (1996:200) are revenge for homicide and various economic issues (p. 115). As a motive, personal aggrandizement, prestige, is actually more commonly associated with higher levels of political centralization (chiefdoms and states). Apparently, subjugation and tribute are the only motives absent in non-centralized polities (p. 116), the major reason being that a kin militia (typical of non-state societies) has no means of maintaining violence beyond a few weeks. Even when continuous raids result in territorial gain (a common enough motive) through the expulsion of opponents, this is not a form of control, but a dispersion (Carneiro 1994; Reyna 1994a). Keeley argues, however, that repeated violence can result in ‘gift’ giving (or tribute), a form of tax similar to ‘extortion rackets exercised by urban gangsters, rural brigands and pirates in civilized societies.’ Thus the motives of centralized versus non-centralized societies cannot be easily distinguished – they do not offer a good set of variables for defining warfare.

A definition of warfare offered by Kelly seems to be applicable to all levels of political centralization, and offers a good working definition for examining prehistoric warfare. Kelly (2000) considers war (including feuds) to be grounded “in application of the principle of social substitutability” (sic, p. 21). And further, “the principle that one group member is substitutable for another in these contexts underwrites the interrelated concepts of injury to the group, group responsibility for the infliction of injury and group liability with respect to retribution” (p. 5). All of this would distinguish it from murder, duels and capital punishment, since these are directed against the perpetrator of a crime.

The origins of warfare

The cultural anthropological literature on warfare is mainly concerned with its evolutionary significance, summed up as ‘when it started and how we can end it.’ Cultural anthropologists consider that biology plays a relatively unimportant part in the emergence of war (Carneiro 1994), although proponents of evolutionary ecology maintain that warfare is based in maximizing inclusive fitness (Gat 1999; Gat 2000a; Gat 2000b) and can not be regarded as characteris-

tic of humans, since it is based in the common heritage of social animals from chimpanzees to wolves (Wrangham 1999). Another commonly evoked source of warfare, population pressure – prominent since Thomas Malthus’ famous *Essay on the Principles of Population* (1798) as a major predictor of the frequency of war – is not supported by cross-cultural studies (Keeley 1996:118). Kang (2000) demonstrates that under certain historical circumstances, warfare can result from the underpopulation caused by environmental stress. However, Kelly (2000:Ch. 3) suggests that population density does play an important role if we limit the analysis to either segmented or non-segmented societies. Keeley (1996:119) recognizes that some relationship between population pressure and frequency of warfare exists; however, this relationship is either complex or very weak, or both, and he concludes that “warring societies are equally common, and peaceable ones equally uncommon at any level of population density” (Keeley 1996:120). Along the same lines, Walker states that “throughout the history of our species, interpersonal violence, especially among men, has been prevalent. No form of social organization, mode of production, or environmental setting appears to have remained free of interpersonal violence for long.” (Walker 2001:573). Since no form of social organization or mode of production can be causally linked with war or peace (Ember and Ember 1997; Otterbein 1997; Otterbein 2000), all societies will eventually indulge in war.

Much less often stressed is the fact that all these societies will know periods of peace and stability, and I would not necessarily agree that peaceable societies are as uncommon as they seem to be: the lack of diversity in responses offered by modern societies to stressors resulting in warfare could be obscuring a number of possible responses in the past. As noted by Kelly (2000:11), the importance of studying peaceful societies cannot be over-emphasized, yet the literature on it is much less abundant than on warring societies (Sponsel 1994).

Any of the above-mentioned factors: biological, ecological and cultural will not necessarily result in warfare if the society is unsegmented. Unsegmented hunter-gatherers have a low frequency of warfare, as they lack the organizational features associated with social substitutability that are conducive to development of group concepts. Segmented foragers, on the other hand, show a much greater frequency of warfare: 16 out of 17 examined (Kelly 2000:51). Thus recognition of group identity provides the best expla-

natory mechanism for the emergence of warfare. It is important to stress, however, that social structure in itself does not result in feuding or war. Certain external conditions will need to be imposed in order to generate warfare. Accordingly, Kelly states that “*warfare is not an endemic condition of human existence, but an episodic feature of human history (and prehistory) observed at certain times and places, but not others*” (2000:75).

Groups archaeologists study

That local history has to be a component in understanding warfare is no less true for the groups that archaeologists study. The examples presented in this volume are societies of relatively long duration and local history, spanning anywhere between 1000 to over 1500 years. Illustrative of the quality of evidence we are dealing with is the fact that we consider the sample size of 100 individuals from a single site of this period as substantial, and often make inferences based on fewer than 20 individuals. Given concerns about preservation bias, the inability to detect soft tissue wounds as causes of (violent) death (Jackes 2004), and the near impossibility of distinguishing between violence and accident, we are left with an even more difficult question. If we can indeed recognize evidence of violence, how can we interpret it: are we dealing with short episodes of unresolved conflict with high mortality rates, or a constant, but low rate of ‘endemic’ warfare? And furthermore, if we can ascertain a case of intertribal warfare can we consider the group (or as is currently done, for the whole era of the Mesolithic) as warlike? Could not sporadic episodes of – even organized – violence, be just what they seem to be: episodes of stress resolved through conflict having no further impact on the society and its long-term history?

How do we proceed from the evidence of an individual’s violent interactions and death to interpretations of organized violence? And taking a step further in the same direction: is all organized violence warfare? Indeed, how do we make this leap in interpretation based on skeletal data alone? The often cited massacre at Offnet (Frayser 1997) could have more than one explanation, and could have involved more than one type of action. How do we interpret a cache of bones: 1) as the simultaneous burial of body parts rescued after a massacre; 2) the simultaneous burial of war trophies; 3) the diachronic burial of decapitated individuals sacrificed to a bloodthirsty god; 4) the diachronic burial of skulls, evidence of an ancestor cult? Any of these explanations,

and a score of others, is possible. Only careful excavation and documentation can give us a sufficiently fine-grained resolution to allow reliable identification of the synchronicity of the burials, a crucial argument in the interpretation of a collection as deriving from a massacre. Unfortunately, for Offnet, and many other sites excavated earlier in the twentieth century, this is not an option.

If we accept that some of this evidence is strong enough to stand meticulous examination, is this indicative of organized violence? And further along the line of deduction, can the violence be interpreted as warfare? Ideally, only when we have answered all these questions in succession, and in the affirmative, can we presume to answer the question, by examining many of these individual societies, of whether the Mesolithic in general witnessed a higher incidence of warfare than previously. In that case, we can start building explanatory mechanisms for this elevated level of warfare. Unfortunately, we are still struggling to prove each case to be one of violence as against a number of other possible explanations. Even where violence is proven beyond doubt, we have too little information to begin delineating a picture of war and peace. Thus we are left with an examination of origins and causes of organized violence and a definition of warfare borrowed from the cultural anthropological literature. I propose that combining the insights of cultural anthropology with skeletal evidence and contextual archaeological information will result in a more reliable picture of prehistoric warfare.

The Mesolithic

Mesolithic times have been singled out as a period for which the evidence of violence becomes far more common than for earlier periods of human history (Frayser 1997; Thorpe 2003; Thorpe 2000; Vencl 1999), to the point that it is taken as a confirmed fact by non-specialists (De Pauw 1998). But is it really so? What unequivocal evidence do we have to claim that the Mesolithic was more violent than earlier periods? And if that, indeed, were true, what explanations can be offered? Is the violence related to sedentism, accumulation, prestige, or other elements of the social structure (Pospisil 1994); or might it not be a sampling error, stemming from the fact that we have far more skeletal remains from the Mesolithic than from earlier periods? If indeed we can demonstrate higher levels of conflict in the Mesolithic than in previous periods, what happens later: more conflict, less conflict? Does violence – and more spe-

cifically, organized violence – play an evolutionary role in creating large-scale aggregations with a centralized power structure (Carneiro 1994), is it the by-product of the centralization of power (Kang 2000), or should war and society be regarded as co-evolving as Kelly (2000) proposes?

For most of the Mesolithic populations, at some point in their history, contact with farming communities was possible (Lubell et al. 1989; Radovanović 1996a), even if it did not occur. Some of the groups participated in these communications through trade (evidenced by imports of non-local products) and possibly by other means. This period of latent and possible change had an important impact on the ideological integrity of these populations. In the case of the Iron Gates Gorge, it produced a stronger ideological integration of the community, at a time when contact with farming societies became possible (Radovanović 1996b; 1996c). It is often suggested that this kind of contact might have resulted in conflict through greater population pressure and territorial claims, as well as other economic or ideological factors (as in Schela Cladovei).

The Iron Gates Gorge

Few archaeological sites have elicited more debate and fewer publications than Lepenski Vir and the contemporaneous Iron Gates Gorge Mesolithic sites. Transition from the Mesolithic to the Neolithic and interactions between foragers and farmers are central themes in this debate. While artifact typology has played a major role in determining Lepenski Vir culture as Epipaleolithic (Boroneant 1973), Mesolithic (Srejović 1972), or Neolithic (Jovanović 1984), it is currently understood that a foraging economy and semi-sedentism characterized these communities even after they had (at least sporadic) contacts with farmers in the second half of the 7th millennium BC (Radovanović 1996a; Roksandic 2000). To date, violent interactions in the region have been discussed only briefly, and in the context of possible conflicts between foragers and farmers at the site of Schela Cladovei, on the left bank of the Danube (Boroneant et al. 1999a).

In an attempt to distinguish between individual acts of interpersonal violence and possible warfare, we examine the available evidence for violent interactions from the six sites on the right bank of the Danube and compare our data with published evidence from the coeval site of Schela Cladovei (Fig. 1). The violent interactions are examined against the backdrop of availability of contact (as defined by Zvebil 1996a) between Mesolithic Iron Gates Gorge foragers and Neolithic farmers (Tab. 1). Since there is no archaeological evidence of defensive structures or armaments, our interpretation is based on bio-archaeological data derived from skeletal lesions associated with violent trauma such as those described by Walker (2001).

Warfare, differentiated from homicide and execution on the basis of “social substitutability” (Kelly 2000.21), and “the interrelated concepts of injury to the group, group responsibility for the infliction of injury, and group liability with respect to retribution” (Kelly 2000.5), requires the examination of individual traumatic lesions in their archaeological context and the assessment of the temporal patterning of violent trauma. Given unequal preservation and problems associated with inferring levels of violence or warfare from skeletal populations (Jackes 2004), we restrict our interpretation to examining how well our data support two hypotheses that have been proposed in the literature for the Mesolithic in general and this population in particular.

The first hypothesis proposes that the Mesolithic period was characterized by endemic violence or warfare. Based on the incidence of projectile points em-



Fig. 1. The map of the region with the sites of the Lepenski Vir Mesolithic/Neolithic complex.

bedded in different skeletal elements, Vencl (1995; 1999) has suggested increased levels of violence in the Mesolithic. Frayer (1997) drew a similar conclusion based on the osteological evidence of a massacre from the Offnet cave, while Thorpe (2000) furthered this argument and proposed that violence was endemic in Mesolithic Europe. However, before these claims can be accepted, we need to examine the role of sampling bias, since, in comparison to earlier periods, a more substantial number of skeletal samples are attributed to the Mesolithic, which could result in the under representation of embedded projectiles and other violent injuries in the Paleolithic period. We also need to examine the possibility that different tools used in combat situations by Mesolithic hunter gatherers in comparison with previous groups could have left more physical evidence of violence, i.e., projectile points could remain in a skeleton, while a spear would have been removed. In addition, given the lack of proper excavation documentation for the Offnet cave, which was excavated in the early part of the 20th century, we cannot exclude burial ritual as the cause for this supposed massacre.

The Iron Gates Gorge sites, with their large number of buried individuals (MNI = 418) and long duration (8200–5500 BC), represent a good choice for testing the hypothesis of endemic violence and warfare in the Mesolithic. In order to validate the first hypothesis, the Mesolithic population of the Iron Gates Gorge should show high levels of interpersonal violence throughout the duration of this cultural group, potentially affecting any member of the community, regardless of age or sex. Caution should be exercised in the strict application of the first requirement, since persons dying a violent death could be subject to a differential burial treatment, in which case only well healed old injuries would be present in the osteological record (Jackes 2004). We propose that a combination of healed and unhealed injuries would be sufficient to warrant the application of the first criterion. The second requirement is self-explanatory, i.e., if violence was endemic, it should be present throughout the duration of the Mesolithic. The third requirement stems from “social substitutability” (Kelly 2000) as a crucial element in defining warfare, since violence is not directed towards an individual, but towards the society as a whole.

The second hypothesis proposes that the conflict in the Iron Gates Gorge Mesolithic resulted from contact with farming communities. Based on the evidence from the site of Schela Cladovei on the left

bank of the Danube, which belonged to the same Mesolithic tradition, Boroneanț et al. (1999a) have suggested that the high level of violent interactions at the site could be explained by contact with advancing farmers.

In order to validate the second hypothesis, the skeletal material from the right bank of the Danube should show a marked increase in violent interactions after 6500 BC, i.e., after contact with farming communities is either established or possible.

Materials and Methods

The six sites from the Iron Gates Gorge Mesolithic and Early Neolithic periods examined here are situated on the right bank of the Danube (see Fig. 1). The Mesolithic sites (Padina, Lepenski Vir, Vlasac, Hajdučka Vodenica) are characterized by a relatively large number of burials (ranging from thirty at Padina to well over a hundred at Lepenski Vir) and houses of the Mesolithic Lepenski Vir type. On a fertile plane outside the gorge, Ajmana and Velesnica are two Early Neolithic sites contemporaneous with the Early Neolithic component of the Lepenski Vir. The first four localities were recovered from salvage excavations in the late 1960s and early 1970s (Jovanović 1966a; 1966b; 1967a; 1967b; 1968a; 1968b; 1969; 1970; 1971a; 1971b; 1972; 1974; Srejović 1966; 1968; 1969; 1971; 1972), while the two sites downstream from the Gorges were excavated in the 1980s (Radosavljević-Krunić 1986; Stalio 1986; Vasić 1986; Živanović 1986). Previous analyses of human skeletal remains have been oriented towards understanding the population characteristics of the individual sites within the paradigm of “anthropo-typology” (Mikić 1980; 1981a; 1981b; 1988; 1978; Nemeskeri and Lengyel 1978a; 1978b; 1978a; 1978b; 1978c; 1978d; 1978e; Schwidetzky and Mikić 1988; Živanović 1975a; 1975b; 1975c; 1976a; 1976b; 1976c). The first overall study concerns only two aspects of population biology (Roksandic 1999; 2000). Paleo-pathological analysis is available only for Vlasac (Nemeskeri and Lengyel 1978b). Only traumatic lesions that could be accurately interpreted as bearing evidence of violent interactions are presented here. They are compared to the published evidence of violent interactions from the coeval site of Schela Cladovei (Boroneanț et al. 1999b; Nicolaescu-Plopșor and Boroneanț 1976; Vencl 1995; 1999). An attempt is made to integrate this data set into the larger picture of the Mesolithic and Neolithic populations in the Iron Gates Gorge.

Table 1 provides a summary of site sequences and chronology for the area. During the Mesolithic proper (from 7500 to 6500 BC), the population of the Iron Gates Gorge is characterized by a sedentary or semi-sedentary pattern of mobility and a foraging economy. During the Contact period (beginning after 6500 BC) we find evidence of contact and interaction with the farming communities in the region, but no change in the pattern of mobility or subsistence (Radovanović and Voytek 1997; Zvelebil 1996b). The Neolithic (regardless of the dates associated with individual sites) is distinguished on the basis of increased reliance on domesticates, even though hunting remains important.

The Iron Gates Gorge skeletal series

The Iron Gates Gorge Mesolithic burial practices include cremation, primary inhumation, secondary interment, removal and re-organisation of body parts within primary burials, as well as the re-burial of skulls and fragmentary remains. Given the diverse burial practices and complex stratigraphy of the sites, coupled with the excessive speed of excavations and inadequate curation of the collection, it is not surprising that the individuals from this group show extreme variability in terms of preservation, with potentially strong effects on reported frequencies of any condition examined.

The most straightforward approach was to rely on the archaeological determination of the burials as separate entities, and to determine the minimal number of individuals (MNI) for each of these burial units following established procedures (Lyman 1994). Apart from burials *sensu stricto*, there were two more categories of bones recovered from the site: 'extra individuals' from within the burial units, and 'scattered human remains' from non-burial contexts. These 'extra individuals' were, because of the patterning of their occurrence, incorporated into the MNI

of individual graves. Since "scattered" bones could have, at least theoretically, belonged to any of the buried individuals, they were not included in the MNI count (for further description of procedures for MNI assessment see Roksandic 2000).

Whenever possible, sex determination was based on pelvic bones and followed standard procedures (Brzdek 2002; Buikstra and Ubelaker 1994). In all other cases, post-cranial robustness provided more accurate results than skull morphology. Adult ages were assigned to four categories: "young adult" (YA), "fully adult" (FA), "mature adult" (MA), and "senile adult" (SA), based on all available age indicators. This approach was deemed optimal, since restricting age assessment to a set of pre-selected criteria would have greatly reduced the number of possible observations (Roksandic and Arbeev 2002; Roksandic and Love 2000).

A total of 263 adults of both sexes were considered. The remaining 155 immature individuals were not considered because of the lack of macroscopically identifiable traumatic conditions that may be associated with violent interactions.

Discerning trauma and violence in the skeletal record

Violence can be traced in skeletal remains from archaeological sites if it involves skeletal trauma. In order to assess injuries correctly, it is necessary to distinguish between pre-mortem, post-mortem and peri-mortem conditions. Evidence of healing is the best indicator that traumatic lesion occurred pre-mortem (Aufderheide and Rodriguez-Martin 1998: 23). Similarly, post-mortem fractures occurring on dry bone are relatively easy to recognize (Berryman and Haun 1996). Because bone needs at least two weeks of survival to show signs of healing (Mann and Murphy 1990), and remains somewhat plastic

up to two months after death, peri-mortem fractures are very difficult to interpret: a blunt force impact on the skull resulting in depressed fractures could easily be the cause of death and therefore a pre-mortem trauma, a post-mortem intentional or ritual breakage of the skull, or even the result of rough handling of the body after death (Walker 2001). The accidental

Period	Padina	Lepenski Vir	Vlasac	Hajdučka Vodenica	Velesnica	Ajmana	Schela Cladovei
Neolithic		IIIb			whole	whole	
Mesolithic/	B(III)	II/IIIa	–	Ib			
Neolithic	B(II)	I(3)	–	Ia			
Contact	B(I)	I(2)	III	Ia			II
Pre	A-B	I(1)	Ib-II				II
Contact	A/A-B	Proto LV	Ia-b	Ia			
Mesolithic	A	–	Ia	–			I

Tab. 1. Synchronisation for the sites examined (Based on Radovanović 1996a:289; Radovanović and Voytek 1997).

breakage of long bone shafts soon after death (due to sediment collapsing within the grave or similar causes) can be misinterpreted as pre-mortem trauma. In many cases careful excavation and recording of the exact position of every bone fragment can clarify the issue (Duday 1987; Duday et al. 1990; Roksandic 2002), but since such documentation does not exist for the assemblage in question, it was necessary to rely on circumstantial evidence, positioning of the trauma, type of fracture, and experience (following Maples 1986).

All evidence of bone fractures was carefully examined for signs of post-traumatic healing. The cases where the breakage was clearly post-mortem were excluded from further consideration. Most lesions that were associated with violence showed clear signs of healing. Peri-mortem trauma was considered only if the position of the injury was concordant with violent encounters.

Reporting prevalence of violent trauma follows the archaeological classification of the sites into three periods: Pre-contact or the Mesolithic proper, Contact or the Mesolithic/Neolithic period, and the Neolithic period (for detailed definitions of these periods, see Roksandic 2000:24). Since unequal preservation of skeletal parts has a potential to underestimate any pathological condition (Roberts and Manchester 1995), the frequencies for the six sites on the right bank of the Danube were calculated by skeletal element. However, element counts were not available for the site of Schela Cladovei, and comparisons between the sites had to be reported per MNI.

Results

Vlasac 4a: Projectile point injury. (Figs. 2, 3) The individual is a young male, 18 ± 3 years old. ^{14}C date of 7500–6500 and dietary data (Grupe et al. 2003)¹ place it in the Mesolithic pre-contact period.

Reconstruction of the pelvic bones revealed an embedded bone projectile in the *iliac fossa* of the left coxal (Fig. 2). The projectile point might have been shot at high velocity (as an arrow or a dart) from the postero-lateral direction. It penetrated the *gluteus maximus* and *medius* and both laminae of the ilium (Fig. 3). Subsequently, the tip and the lower portion were broken off, leaving a 12 mm long em-

bedded portion, 4 mm in diameter at the point of penetration and 3 mm at the point of exit. It is impossible to ascertain whether the breakage happened during the impact or after death. No micro-trauma that could indicate a failed attempt to remove the projectile from the bone *in vivo* could be observed, suggesting a post-mortem scenario for the breakage; alternatively, the micro-trauma could have been obliterated by post-traumatic bone remodeling.

Whether we interpret the above evidence as indicating temporary, post-traumatic survival or not, several possible explanations can be offered for this injury: 1) a hunting accident, 2) homicide, 3) execution, or 4) warfare (including feuding). Given the position of the impact – lateral and posterior in the lower part of the body – execution would be the least likely scenario. A hunting accident, homicide, or warfare are equally likely, as they could all result from an ambush; the age and sex of the victim are



Fig. 2. Reconstructed left coxal of Vlasac 4a with embedded projectile point highlighted. Inset shows the cranial aspect of the coxal with the projectile point traversing the bone.

¹ Grupe et al. (2003:Tab. 1a) report the calibrated ^{14}C age as 7600–6500 BC without any further details on the specimen Laboratory ID number and methods of calibration, and isotope values within the range of those reported for Mesolithic Vlasac by Bonsall et al. (1997:72), concordant with Radovanovic's (2000) "early diet type" in which most of the protein was obtained from aquatic food sources.



Fig. 3. The fragment of the Vlasac 4a ilium in anatomical position.

compatible with all three. While hunting accidents were probably not very common, they cannot be excluded. Homicide from an ambush seems to be the most likely explanation, but whether it is an individual act of violence or evidence of warfare cannot be deduced from a single case.

Vlasac 51a: Parry fracture of the right ulna with pseudo-articulation. (Fig. 4). The skeleton Vlasac 51 is a relatively well preserved, fully mature female. The ^{14}C date of 7600 to 7080 BC calibrated (2σ) (OxA-5822, Bonsall et al. 2000.123, Tab. 3), and an 'early diet type' (Bonsall et al. 2000; Radovanović 2000) indicate the pre-contact Mesolithic age.

The lower third of the right ulnar shaft displays a non-united transverse fracture (Fig. 4), with surfaces remodeled into a pseudo-articulation, induced by lack of immobilization during callus formation. The compact bone lining the involved ends shows areas of pitting and an irregular surface. There are no pathological changes on the right radius or any other element of this skeleton.

The type of fracture suggests a direct trauma that could have resulted from a blunt object breaking the bone in a defensive movement of the arm raised to protect the head. Smith (1996.84) cautions that in cases where the potentially corroborative cranio-facial injury data are lacking, a violent aetiology for mid-shaft ulna fractures is less likely, and he lists a

number of possible causes for this type of forearm fracture: accident, stress or fatigue, or an underlying pathological condition, in addition to interpersonal violence. However, successful fending off of a blow could prevent cranial trauma. Therefore, violence should be considered as a possible explanation for this injury.

Vlasac 82a: Depressed fracture on the frontal bone. The individual is very probably a mature or senile male. As no absolute date or isotope values are reported, the burial is assigned to the pre-contact Mesolithic period based on the site stratigraphy (Radovanović 1996b).

On the right side of the frontal bone, between the coronal suture and the frontal protuberance, there is a large (45 mm x 25 mm), ellipsoid, fully healed depressed injury. The base of the lesion is rough, without evidence of change in bone structure, and the medial margin is prominent. In axial projection, there is a well-defined area of radiopacity, with increased bone density resulting, probably, from a post-traumatic calcified intraosseous hematoma. In addition, marked surface porosity is seen on the parietal bones along the sagittal suture. The type of



Fig. 4. Vlasac 51a: radius and ulna, pseudoarticulation of the right ulna highlighted and in detail.

force needed to create this pattern of fracture suggests a blow to the head by a hard, blunt object from an oblique superior direction.

Lepenski Vir 69: repeated depressed fractures on the frontal bone. Field documentation and published photographs (Radovanović 1996b.172, Fig. 4.2; Srejović 1969.161, Fig. 64) reveal a particularly well preserved and complete skeleton. However, only the skull and two femora could be found during our 1998 analysis, probably due to inadequate collection practices in the field. The individual was male of mature adult age. Both the 7000 BC ^{14}C date (calibrated) reported by Grupe et al. (2003.Tab. 3a) and the isotope data (Bonsall et al. 1997.64–65, Tabs. 3 and 4) indicate the pre-contact Mesolithic period.

Two healed depressed fractures are observed. The first one, on the frontal squama approximately 15 mm anterior to the bregma, is a deep oval depression (35 mm x 24 mm), with smooth walls and rounded edges. The other, located in the region of the right frontal eminence, is a shallow irregular depression (14 mm x 7 mm), with a prominent lower edge. In addition, in the region of the coronal suture of the right parietal and frontal bone there is an ellipsoid defect (35 mm x 12 mm) that lacks the characteristic concentric fracture and beveling typical of fresh bone breakage (Berryman and Haun 1996), and was probably damage to the dry bone because of the irregular and sinuous aspect of some of the issuing cracks (Botella et al. 2000.93).

Vlasac 69: Repeated depressed fractures on the frontal bone. (Fig. 5) The skull and the post-cranial bones indicate a mature adult male. Since no absolute age is reported, assignment to the Mesolithic/Neolithic period is based on archaeological data (Radovanović 1996b). Dietary data, however, suggest an 'early diet type', indicating pre-contact times.

A healed depressed fracture (Fig. 5a) is observable in the area of the right frontal eminence. It is small and shallow (8 mm x 6 mm), with a prominent lower edge. The unhealed injury (15 mm x 9 mm) – with several thin fissures on its lower margin – is situated on the left half of the frontal bone, in the area of the frontal eminence (Fig. 5b). The position of the fracture is concordant with interpersonal violence and suggests that the force was applied from an antero-superior direction with a blunt instrument. The prominent radiating fractures in the area should be considered as a peri-mortem, or more probably, a

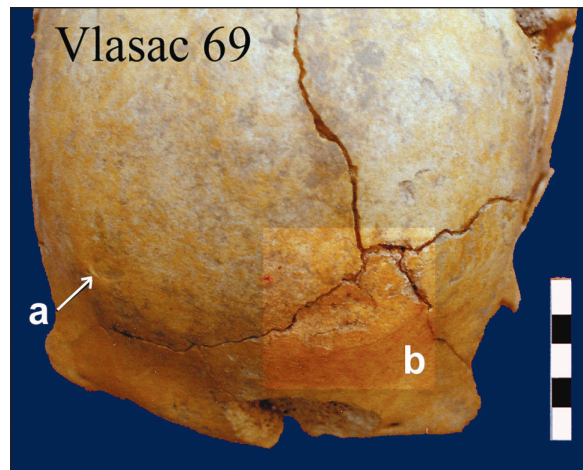


Fig. 5. Vlasac 69. Evidence of a) a small healed depressed fracture and b) a perimortem blunt force trauma on the frontal bone.

post-mortem trauma. The only other pathology observed on elements associated with this skull is the eburnation of the proximal humerus.

Lepenski Vir 20: Blunt impact with a conical object. (Fig. 6) The field drawing of the burial (Rokсандić 2004.63, Fig. 10) shows a nearly complete post-cranial skeleton; however only the skull was found during the 1998 analysis. The individual was probably a mature adult male. No absolute dates or dietary information exist for this burial. Archeological data suggest either Mesolithic/Neolithic (Lepenski Vir II) or Neolithic (Lepenski Vir IIIa) provenance, both of which fall within the period when contact with farming communities became possible (*sensu* Zvelebil 1996b).

The skull is almost complete, with fragments of the base and the right frontal bone adjacent to the lesion missing. The injury is a fully healed depression of the frontal squama in the area of the right frontal protuberance (22 mm x 24 mm). The fracture is pyramidal in shape, with smooth walls and poorly defined rounded margins. The adjacent annular zone of bone is sclerotic. The impact is much deeper and narrower, and appears to have been produced by an object with a sharp conical end.

Discussion

A total of six skeletons excavated on the right bank of the Iron Gates Gorge exhibit traces of *probable* violent trauma (Tab. 2). While violence as etiology is the most likely explanation in the case of the five men, the parry fracture recorded in the female individual is concordant with both accident and violence.

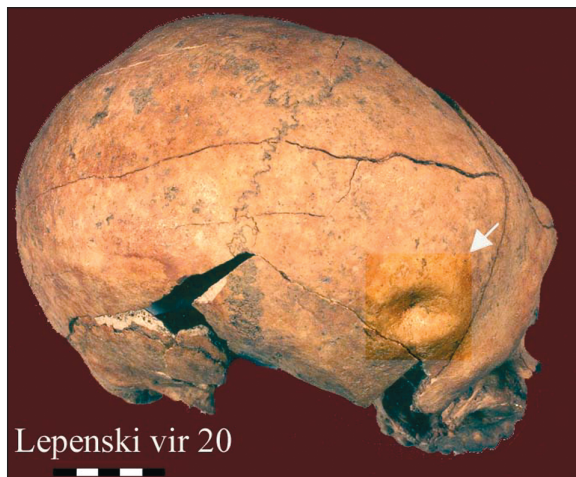


Fig. 6. Lepenski Vir 20. a) Arrow points to the depressed frontal impact produced with a conical object.

There are two injuries that could have been lethal: Vlasac 69 could have died of an unhealed cranial trauma, and Vlasac 4a from the consequences of the projectile penetration shortly after the incident. This allows us to argue that there is no differential burial treatment of the victims of violence, and that the frequency is, at least in that respect, a realistic estimate of the frequency of violent interactions. Cranial depressed fractures are consistent with 'face to face' fighting: all are on the frontal bone, with definite side preference: the four healed impacts are on the right side of the skull and the one unhealed injury is on the left. Two skulls have multiple impacts, of which at least one is healed, further confirming violent etiology (Judd 2002).

These six violent injuries are recorded on the 263 (2.3%) individuals examined (Tab. 3): 1/86 ulnas (1.2%), 1/52 coxae (1.9%), and 4/109 skulls (3.7%). The difference in frequencies per MNI and per ele-

ment is not significant (Chi-square = 1.4009, distribution is not significant, p is less than or equal to 1, allowing us to consider frequencies per individual when those per element are not available).

Frequencies for the two post-cranial injuries are not conclusive, and can not be compared between periods as only one injury is present per bone type. Four of the 109 (3.7%) sufficiently preserved skulls show evidence of blunt force trauma. Two skulls belong to the pre-contact, Mesolithic period (2/42 or 4.7%), and the remaining two to the post-contact Mesolithic/Neolithic or Neolithic periods (2/59 or 3.4%). It was not possible to assign period affiliation to a further eight skulls. The difference between the pre- and post-contact periods is not significant (Chi-square = 0.1214; p is less than or equal to 1).

With such low frequencies in the series, we can not claim that the material meets the first criterion of elevated levels of interpersonal violence. When injuries are examined by element and sex combined, the picture is different: all four are recorded on the 42 preserved male skulls, raising the frequency to 9.5%, and indicating that interpersonal conflict was not as rare as overall frequencies suggest, at least among men.

Given low overall frequencies and the small number of injuries, the second criterion (of relatively equal distribution of the injuries over the duration of Mesolithic) can not be evaluated; to further elucidate the question of endemic warfare we have to turn to the third criterion. Out of six individuals with violent injuries, five are men (83.3%) and only one is a woman. At least one individual is concordant with social substitutability as the principal determinant of warfare. As in the case of the second criterion, low

Site	Burial	period	¹⁴ C BC cal	diet	sex	age	Trauma
Vlasac	82a	M	no data	no	m	MA/SA	Frontal (R)
Lvir	69	M	**7000	early	m?	MA/SA	Frontal, healed (R,L) perimortem (R)
Vlasac	51a	M	*7600–7080 (2σ)	early	f	FA	Ulna parry fracture (R)
Vlasac	4a	M	**7600–6500	early	m	YA	Projectile point in the ilium (R)
Vlasac	69	M/N	no data	early	m?	MA	Frontal, healed (R) perimortem (L)
Lvir	20	M/N/N	no data	no	m?	MA	Frontal, deep conical (R)

Burial = number assigned to the burial by excavators. Period: M = Mesolithic, M/N = Mesolithic in contact with Neolithic, N = Neolithic; ¹⁴C: radiocarbon date where available * from Bonsall et al. (1997,2000); ** from Grupe et al. (2003) Diet: early = predominantly aquatic, late = large portion of terrestrial (Radovanovic 2000). Sex: m or f = male or female assigned based on pelvic remains, m?/f? male or female assigned based on postcranial robusticity; age: YA = young adult, FA = fully adult, MA = mature adult, SA = senile adult. Trauma, position and type of traumatic lesion.

Tab. 2. All recorded incidences of skeletal trauma possibly caused by violence in the Iron Gates Gorge sample.

Site	skull					ulna					pelvis				
	total	VT	%	M	F	total	VT	%	M	F	total	VT	%	M	F
Precontact	42	2	4.8	19	22	33	1	3.0	13	18	20	1	5.0	8	11
L Vir	4	1	25.0	4	0	1	0	0	1	0	1	0	0	1	0
Vlasac	31	1	3.2	14	16	28	1	3.6	10	16	19	1	5.3	7	11
Padina	7	0	0	1	6	4	0	0	2	2	0	0	0	0	0
Postcontact	59	2	3.4	23	33	41	0	0	19	21	30	0	0	16	14
L Vir	19	1	5.3	6	10	9			4	4	3			1	2
Vlasac	17	1	5.9	6	10	14			5	9	8			3	5
Padina	9			3	5	6			3	3	6			4	2
H. Vod.	6			6	3	4			4	0	5			5	0
Ajmana	5			2	2	5			3	2	5			3	2
Velesnica	3			0	3	3			0	3	3			0	3
Not known	8					12					0				
total	109	4	3.7	42	55	86	1	1.2	32	30	50	1	2.0	24	25

VT = violent trauma; M = male; F = female.

Tab. 3. Skeletal elements affected by violent injuries. Breakdown by pre-contact Mesolithic and post-contact Mesolithic/Neolithic and Neolithic periods. Cumulative values for Pre-contact and Post-contact are outlined in bold.

prevalence makes it impossible to ascertain that the third criterion is not met, since the low frequency of females and lack of children with violent injuries could be the result of overall low frequency, in which case warfare can not be excluded. On the other hand, the one female in the sample could be interpreted as a result of individual interpersonal or domestic violence, non-indicative of warfare. The already mentioned elevated frequencies of skull injuries in men strongly suggest that violence indeed was a 'male business' at these sites.

Low overall frequencies and the low prevalence of violent injuries in females suggest that the first hypothesis of endemic warfare in the Mesolithic is not supported by the Iron Gates Gorge evidence.

Four of the six individuals with violent injuries (66%) are from the pre-contact period in the Iron Gates Gorges (Tab. 3). The remaining two are individuals with ambiguous chronological designation, Vlasac 69 showing 'early diet type' – isotope values, and Lepenski Vir 20 having no data. Therefore, the criterion for establishing contact with farmers as a cause of warfare in the region is not substantiated by the sites on the right bank of the Danube. In order to evaluate this question for the whole region in the Mesolithic/Neolithic contact, we scrutinize the evidence from Schela Cladovei.

The site of Schela Cladovei, situated on the left bank of the Danube, in the fertile flood-plane downstream from the Gorges, shows a very different picture from the rest of the sites of the Lepenski Vir complex. Out

of the total of 57 individuals excavated in two field campaigns, McSweeney et al. (2000) reported five individuals (four males and one female), with possibly fatal and multiple projectile wounds, and 14 individuals with evidence of other violent trauma (19/57 or 33.3%).

Seven well-documented cases considered here come from 28 individuals in the meticulously excavated Area III (7/28 or 25%): two skulls (female 42 and male 48) show evidence of blunt force trauma; two individuals, one male (46) and one female (49) had 'parry' fractures, and three had embedded projectiles: bone projectiles in the male individuals 48 and 50, and a flint projectile in individual 47 for which the sex was not reported (Boroneanț et al. 1999a: 389). In terms of dietary information, they all form a tight cluster, interpreted by Bonsall et al. (1997) as predominantly aquatic indicating the Mesolithic, pre-contact period. ¹⁴C dates are more ambiguous as they fall between 7450–6439 BC calibrated (2σ) when corrected for freshwater reservoir effect (Bonsall et al. 2000: 123, Tab. 3), concordant both with the pre-contact Mesolithic and the beginning of possible contact with the Neolithic.

Table 4 summarizes the differences between Schela Cladovei Area III and Vlasac and Lepenski Vir in terms of prevalence of different types of injury. As many as seven out of 28 individuals at Schela Cladovei Area III (25%) show one or more violent injuries, compared to four out of 118 (3.4%) for Vlasac and two out of 103 (1.9%) for Lepenski Vir. The distribution is significant (Chi-square = 25.4606; *p* is less

than or equal to 0.001). A further look at the breakdown per type of injuries shows persistent differences between the left and the right bank for both projectile points and 'parry' fractures. Blunt force trauma to the skull shows relatively similar frequencies for all three sites, with one important difference: it is present in both men and women at Schela Cladovei and only in men at the other two sites. The significant difference in both the prevalence and pattern of injury between Schela Cladovei and sites in the Iron Gates Gorge suggests different archaeological contexts and behaviors associated with violence.

Schela Cladovei III material is restricted in time; the dates form a tight cluster, further corroborated by relatively uniform burial practices. Concordant with the pattern of injuries, they could represent either a single episode of group violence, or a series of related events. Given the number of females involved, it is reasonable to suggest that the whole group was targeted. This meets the criteria of substitutability of an individual, a crucial condition in the identification of warfare as defined by Kelly (2000). Warfare (and raiding as part of it) is a likely explanation for this site. The episode of war is, however, not associated with contact with farmers. The dates do not fall clearly after 6500 BC, and the dietary information suggests that the crucial change between pre-contact and post contact diet type had not taken place. Accordingly, while the site meets the criterion for warfare, it does not clearly fall in the post-contact period and can not be used to support the second hypothesis.

On the basis of the evidence presented above, the violent interactions on sites on the right bank of the Danube in the Gorges could be explained as a series of unrelated and diachronic episodes. These incidents could have as easily happened within the community as with members of other groups. The episode

of violent conflict concordant with definition of warfare at Schela Cladovei remains isolated and is not related to the contact with farmers.

Conclusions

Violent interactions in the Iron Gates Gorge Mesolithic and Mesolithic/Neolithic Contact period are confirmed by a restricted number of skeletal elements with traumatic injuries for which violence is a likely etiology. There is an important difference in the pattern of violence between the right bank of the Danube in the Gorges area and the flood-plain on left bank downstream from the Gorges. When viewed separately, the Gorges area shows sporadic violence and does not support the first hypothesis of endemic warfare in the Mesolithic. Not only is there very little evidence of violence, most of it is non-lethal (ritualized?) face-to-face conflict among men (Walker 1989). While no trend towards increase or decrease can be discerned given the restricted numbers of individuals with trauma, it is apparent that violence on the right bank is not associated with contact with farmers.

Schela Cladovei follows a different pattern, with high levels of violence and involvement of both sexes. The individuals form a tight cluster in terms of ¹⁴C dates, dietary information and burial ritual. Mesolithic type diet and dates, which are borderline between the pre-contact and contact periods, indicate that the contact with Early Neolithic cultures further south in the Balkans was – if at all possible – on a small scale. A large displacement of farming communities that would shrink the territory of Mesolithic peoples and cause stress is unlikely at this early stage. The *causa belli* that have most often been evoked – decrease in territory under pressure from the Neolithic communities in the region, increase in population and other stresses associated with contact

site	Projectiles/ per individual	%	parry fracture/ per element	%	skull fractures/ per element	%	all injuries/ per individual	%
Schela Cladovei Area III	3/28	10.7	2/28*	7.1	2/28	7.1	7/28	25.0
Vlasac	1/118	0.8	1/42	2.3	2/48	4.2	4/118	3.4
Lepenski Vir	0/103	0.0	0/10	0.0	2/31	6.4	2/103	1.9

* No data on number of skulls or ulnae in Schela Cladovei were reported, accordingly, the frequencies could be even more elevated if reported by element. Site photos suggest relatively complete skeletons.

Tab. 4. Comparison between the three sites for violent injuries per type of injury. Schela Cladovei data are restricted to the Area III for which the numbers for different types of injury are reported by Boroneanț et al. (1999).

with farmers can therefore be excluded as explanatory mechanisms for these violent interactions.

Based on the evidence presented, warfare can not be ascertained on the right bank of the Iron Gates Gorge. If there indeed was organized violence and warfare, as suggested by the Schela Cladovei data, it was localized and temporarily restricted, countering the notion of endemic warfare. Conflicts caused by advancing Neolithic farmers can be excluded on the basis of the evidence presented here, since most of the violent interactions happened during pre-contact or early contact times.

Examining archaeological data with building regional histories in mind strongly counters generalizations based on sporadic evidence of warfare. While it is possible and even likely that organized violence

increased in the Mesolithic due to a number of changing mobility patterns and increased territoriality, and the possible segmentation of groups, it has to be examined in the local context with all the data available.

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