The Later Aeneolithic in Southeastern Europe

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Abstract

Changes in the European economy and society during the later Aeneolithic (late fourth to third millennia B.C.) were fundamental in determining the trajectory of cultural change in Europe for at least the next 1500 to 2000 years. Recent research has shown that this period, rather than being a short transition between the "Neolithic" and the "Bronze Age," begins earlier and lasts longer than has been traditionally thought. Thus, the sociocultural, economic, and material transformations observed by the end of the Aeneolithic may be seen to be the result of gradual changes over a considerable period of time, rather than necessitating explanations involving unique dramatic events such as migrations or invasions.*

INTRODUCTION

In southeastern Europe the two millennia that begin at about 4500 B.C. form a period that does not fit into the classic Three Age system. What one calls it is implicitly based on how one approaches it. If technology, especially metallurgy, forms the basic criterion to differentiate this period from the one before, then one opts for Copper Age (or the fancier "Chalcolithic"). The same emphasis is implicit in the more common designation "Aeneolithic" (Lat. *aeneus* = of copper or bronze). Considered as a bridge between the Neolithic and the Bronze Age (an attempt to hold onto the Three Ages), it can be considered a "transition period." This paper concentrates on the latter part of this time span, the late fourth to late third millennia B.C., the later Aeneolithic, Chalcolithic, or Copper Age, depending on one's terminology, and the centuries immediately following it, the beginning of what is traditionally referred to in southeastern Europe as the Early Bronze Age.

In fact, the period from about 3200 to 2300 B.C., no matter what it may be called, saw changes in the European economy and society that, if not as striking as the beginnings of agriculture that marked the start of the preceding Neolithic, were equally fundamental in determining the trajectory of cultural change in Europe for at least the next 1500 to 2000 years (or until well into the Hallstatt/La Tène Iron Age). We believe that recent research has shown that this period, rather than being a short transition between the "Neolithic" and the "Bronze Age," begins earlier and lasts longer than has been traditionally thought. Thus, the sociocultural, economic, and material transformations observed by the end of the Aeneolithic may be seen to be the result of gradual changes over a considerable period of time, rather than necessitating explanations involving unique dramatic events such as migrations or invasions.

Beginning in the early fourth millennium B.C., southeastern Europe underwent major changes in settlement and subsistence economy that marked a very significant break from the Neolithic.[1] These changes included the abandonment of many long-settled sites, an apparently more dispersed settlement pattern, and a greater dependence on animal husbandry. The socioeconomic patterns associated with these changes form the basis for the ensuing Bronze Age. It is closer to reality to dispense with the traditional labels altogether, and to treat the developments in southeastern Europe during the fourth and third millennia B.C. together, although they encompass portions of the traditional Aeneolithic and Bronze Age.

Recognizing that southeastern Europe is not commonly the focus of Western European and North American archaeological studies, we will begin with a review of the general geography and cultural sequence.[2]

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[1] T. Champion, C. Gamble, S. Shennan, and A. Whittle, *Prehistoric Europe* (New York 1984) 154; A. Sherratt, "Plough and Pastoralism: Aspects of the Secondary Products Revolution," in I. Hodder, G. Isaac, and N. Hammond eds., *Pattern of the Past* (Cambridge 1980) 261–306.

[2] Surveys or review articles covering the later part of the Aeneolithic and the beginning of the Bronze Age in southeastern Europe are rare and generally limited to a specific region. Perhaps the most accessible are the relevant chapters in *CAH* III, 1 (1982) and R.K. Evans and J.A. Rasson, "Ex Balcanis Lux? Recent Developments in Neolithic and Chalcolithic Research in Southeast Europe," *American Antiquity* 49 (1984) 713–41. Sections of J. Coles and A.F. Harding, *The Bronze Age in Europe* (London 1979), and R. Tringham, *Hunters, Fishers and Farmers of Eastern Europe, 6000–3000 B.C.* (London 1971) contain good, if now somewhat dated, information. A more detailed chronology of the area is discussed in R.W. Ehrich and H.A. Bankoff, "Geographical and Chronological Patterns in East Central and Southeastern Europe," in R.W. Ehrich ed., *Chronologies in Old World Archaeology*[2] (Chicago, in press).

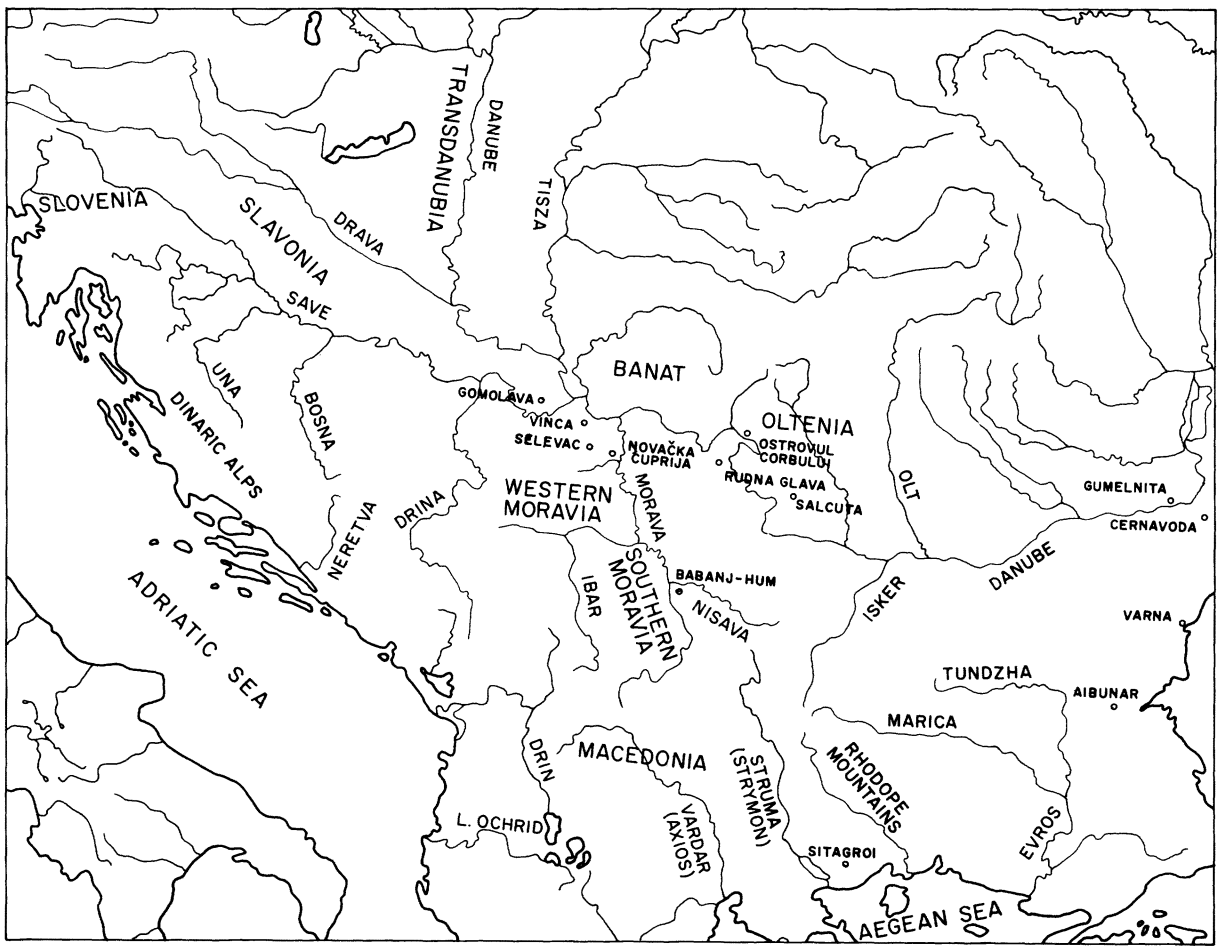

Fig. 1. Map of archaeological sites in southeastern Europe

GEOGRAPHIC BACKGROUND

Geographically, our focus will be the middle Danube river basin, a drainage that includes the "Carpathian Basin," as well as the Moravian Corridor, the Alpine tributaries of Transdanubia and Slovenia, and the southern tributaries of the Sava and the Danube (such as the Morava), which flow northward from the Balkan ranges of Bosnia and Serbia (fig. 1).[3] This river system drains an area of almost 730,000 m^2 of southeastern Europe.[4] What is most striking about this area, when it is viewed in comparison to the Middle East and circum-Mediterranean regions, is the temperate climate and the year-round free accessibility to water.

Looking at the different subdivisions of this larger area, the "Carpathian Basin" includes Pannonia in the west, the Great Hungarian Plain in the center, and Transylvania in the east. Although physiographically (and until 1920, politically) a unity, the Carpathian Basin has historically been broken up into many regions including the Vojvodina, Transdanubia, the Little Alföld, the (Great) Alföld, Transtisia, Transylvania, and Slovakia, all of which lie within the Carpathian arc.

Across the Danube to the south loom the mountains of Šumadija, Serbia proper, broken only by the plain of the Morava, which flows northward into the Danube between Smederevo and Pozarevac. Almost immediately to the east of the Morava plain, from the left bank confluence of the Nera, the Djerdap region of the Danube begins. Here the river, which has heretofore run easily at the southern edge of the level loess country of the Pannonian Plain, violently cuts

[3] R.W. Ehrich, "Geographical and Chronological Patterns in East Central Europe," in R.W. Ehrich ed., *Chronologies in Old World Archaeology* (Chicago 1965) 403–58.

[4] G. Hoffman, *A Geography of Europe* (New York 1953) 522.

through a system of alternating narrow defiles and slightly wider basins extending for more than 150 km from Golubac on the Yugoslav side downstream to Turnu Severin on the Romanian bank. This part of the river is sometimes referred to as the "Iron Gates," although the term more properly belongs to a specific gorge near Sip. Today considerably widened and tamed by the lakes formed behind two dams (Djerdap I just upstream of Kladovo, Djerdap II at Prahovo), this was formerly the wildest part of the river, and formed the nearly impenetrable boundary between the Danube's middle and lower courses. Here the river originally descended from 70 to 40 m above sea level, a far steeper gradient than anywhere else along its length. Whereas the width of the Danube above the gorge sometimes exceeded 1800 m, in the narrower defiles of the Iron Gates it shrank to less than 150 m.[5] The river depth varied considerably, at points reaching 20 m, with potholes eroded to 50 m below the river's surface. At other places sand and rock bars blocked the shallower portions. Thus, passage through this part of the river by water was extremely hazardous.

The river gorges in this area are actually narrow valleys, rather than perpendicularly cut canyons, the steep sides of which slope to the water's edge. In the narrow defiles the Danube fills the valleys from side to side, and the sheer walls may reach up to 610 m above the original river level. Land passage along the river was difficult or impossible; the trails through this region, if they existed, would have run along the ridgeline as do the modern roads. In the wider basins the river again hugs the southern (Serbian) side, while the Romanian bank is usually less steep.

This, then, is a general and compressed geographic and topographic picture of the Middle Danube drainage. It includes regions within present-day Hungary, Romania, Yugoslavia, and, to a lesser extent, Bulgaria.

The authors' research has been concentrated in the valley of the Velika (Great) Morava. This river flows northwards some 170 km through central Serbia from the junction of the Juzna (Southern) Morava and the Zapadna (Western) Morava at Stalac. Its confluence with the Danube at Smederevo is one of the most important natural crossroads of Europe. Here, five major waterways converge: the Morava, opening up the way to the south; the Sava, leading westward to the Alpine forelands; the Danube, the primary route to and from Central Europe; the Tisa, running down from Hungary and Slovakia, whose plain leads into the metal-rich mountains of western Transylvania; and the Tamiš, connecting to the rich lands of the Carpathian Basin. To the east across the Morava flood plain (8–12 km wide in its lower course) lie the copper-ore-bearing mountains of East Serbia. To the west, easily accessible along the many small Morava tributaries, lie the loess-covered rolling hills of Šumadija.[6] These waterways form the primary natural routes of communication, either by offering navigable passages for water traffic or broad river valleys and easy availability of water for humans or animals. These riverine routes continued to be important throughout prehistoric and historic times, as can be seen even today by inspection of the routes of major roads and railroads. The river and tributary stream terraces also provide favored environments for settlements, often with access to arable river-bottom land and woods, as well as upland pastures. The importance of these rivers and their valleys in the clarification of the culture history and processes of change in southeastern European prehistory is a corollary of their importance as routes linking different natural regions and different local archaeological cultural sequences.

CULTURE HISTORY

With the geographical focus thus delineated, our next task is to outline the general cultural sequence of the middle Danube. We should stress at this point that we are talking about traditionally defined archaeological cultures, identified predominantly on the basis of pottery styles and, to a lesser extent, on other aspects of material culture.[7] One of the most serious shortcomings of the archaeology of southeastern Europe is the paucity of data from intensive, systematic, field survey.[8] This makes the estimation of actual site numbers and population density extremely suspect. Cultural areal distributions, however, are more easily worked out on the traditional basis of non-intensive, non-systematic survey and the plotting of characteristic stray finds.[9] For archaeologists who do not specialize in this area the unfortunate practice of labeling cultural entities or groups on the basis of site names,

[5] Great Britain: Naval Intelligence Division, *Jugoslavia (Geographical Handbook Series,* BR 493), vol. I: *Physical Geography* (London 1944/1945).

[6] See R. Tringham and D. Krstić, *Selevac, A Neolithic Village in Yugoslavia* (Los Angeles, in press) for a review of the geology of Sumadija with relevant literature.

[7] See Evans and Rasson (supra n. 2) 716.

[8] See J. Chapman's chapter on the regional setting of Selevac in R. Tringham and D. Krstić (supra n. 6).

[9] See Ehrich (supra n. 3); also, R.W. Ehrich, "Culture Areas and Culture Boundaries Through Time: Tier 3," in E.-J. Rowlett and R. Rowlett eds., *Horizons and Styles; Studies in Early Art and Archaeology* (Göteborg 1987).

which often includes defining the same culture by different names as one crosses modern national borders, discourages casual interest. What follows is a simplified sequence.

The later Neolithic period in the middle Danube drainage is characterized by sites of increasing size, complexity, and stability. Within Serbia and its environs, extending from Macedonia in the south through the Vojvodina in the north, this is the Vinča period, perhaps best known for its attractive figurines and burnished pottery.[10] Vinča and related cultures also occupy much of the interior of the Carpathian Arc. Contemporaneous Salcuta-Krivodol pottery is current in the mountainous regions of the Southern Carpathians.[11] In southeastern Transylvania and Moldavia, as well as further east, Cucuteni farmers settled,[12] while in the lower Danube, the contemporaneous and Vinča-related culture is Gumelnita, paralleled in eastern Bulgaria by the culture which in its latest stages is known from the famous cemetery at Varna.[13]

Some Southeastern European archaeologists believe that these cultures generally represent the continuation and expansion of the farming cultures of the earlier Neolithic, which were established in the area several millennia before.[14] Others still cling to the notion of a second Neolithic colonization or migration.[15] All agree that during the earlier Aeneolithic period, settlements continued to grow in size and number. New settlements were also founded on secondary areas around the periphery of the older settled regions. These trends of expansion and intensification are general in Europe at this time.[16] In southeastern Europe habitation sites include both single stratum villages and multi-stratum tell settlements. During this period tell occupation continues in the East Balkan area at sites like Polyanitsa,[17] where houses within a square palisade become more crowded through time, while in the West Balkans, including the Morava Valley, the flat settlements of the later Vinča (Vinča C–D or Vinča-Pločnik) also provide some evidence for a more nucleated village plan.[18]

As the Aeneolithic progresses, cultural diversity increases. Vinča traditions persist immediately along the Danube and in interior Serbia down into Macedonia.[19] In Oltenia, the eastern Carpathian regions, and the lower Danube, new sites of the Cernavoda culture are found.[20] In the Morava valley and eastward into Bulgaria, the contemporaneous cultures can be placed into the Bubanj-Hum sequence, named after two sites on the Morava near Niš.[21] Both of these eponymous sites, Bubanj and Velika Humska Čuka, present stratigraphic problems, neither preserves the entire cultural sequence of the so-called Bubanj-Hum periods, and neither site has ever been fully published. The derived chronology is based partially on vertical stratigraphy and partially on comparative ceramic typology. With that in mind, we can note that Bubanj-Hum is divided into several numbered phases, which continue into the Early Bronze Age. Bubanj-Hum Ia is the Serbian variant of the middle Aeneolithic Sălcuţa-Krivodol-Bubanj Complex,[22] which is widespread in the central Balkans. Sites of

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[10] M. Vasić, *Preistoriska Vinča* 1–4 (Beograd 1932–1936); J. Chapman, *The Vinča Culture of South-East Europe: Studies in Chronology, Economy, and Society* (*BAR-IS* 117, i and ii, 1981); M. Gimbutas, *The Goddesses and Gods of Old Europe: Myth and Cult Images*[2] (Los Angeles 1982); *Vinča u praistoriji i srednjem veku* (Belgrade 1984); Tringham (supra n. 2).

[11] D. Berciu, "Les nouvelles fouilles de Salcuta (Roumanie) et le problème des groupes Bubanj (Yougoslavie) et Krivodol (Bulgarie)," in J. Böhm and S. DeLaet eds., *L'Europe à la fin de l'age de la pierre* (Prague 1961) 125–34.

[12] L. Ellis, *The Cucuteni-Tripolye Culture: A Study in Technology and the Origins of Complex Society* (*BAR-IS* 217, 1984).

[13] M. Gimbutas, "Gold Treasure at Varna," *Archaeology* 30 (1977) 44–51; I. Ivanov, "Les fouilles archéologiques de la necropole chalcolithique à Varna," *Studia Prähistorica* 1–2 (Sofia 1978) 13–26; A.C. Renfrew, "Varna and the Social Context of Early Metallurgy," *Antiquity* 52 (1978) 199–203.

[14] See N. Tasić and S. Dimitrijević, "Uvod," *Praistorija Jugoslavenskih Zemalja* III (Eneolit) (Sarajevo 1979) 13.

[15] See M. Garašanin, "Zur chronologischen und kulturellen Wertung der Bubanj-Funde," *Nachrufsschrifte für Vladimir Milojčić* (Mainz 1979).

[16] Champion et al. (supra n. 1) 133.

[17] H. Todorova, *The Eneolithic in Bulgaria* (*BAR-IS* suppl. 49, 1978); H. Todorova, *Kupferzeitliche Siedlungen in Nordostbulgarien* (Munich 1982).

[18] Chapman (supra n. 10); Tringham and Krstić (supra n. 6).

[19] M. Garašanin, *Praistorija na tlu S.R. Srbije* (Belgrade 1973) 65–114.

[20] N. Tasić, "Černavoda III i Boleraz nalazi u jugoslovenskom Podunavlju i problem hronološkog odnosa kultura bakarnog doba u karpatsko-podunavskim oblastima," *Balcanica* 6 (1975) 9–22.

[21] M. Garašanin, "Neolithikum und Bronzezeit in Serbien und Makadonien," *BerRGK* 39 (1959) 1–130; M. Garašanin, "The Stone Age in the Central Balkan Area," *CAH* III, 1 (1982) 75–135; "The Eneolithic Period in the Central Balkan Area," *CAH* III, 1 (1982) 136–62; "The Bronze Age in the Central Balkan Area," *CAH* III, 1 (1982) 163–86; M. Garašanin, "Considerations sur la transition à l'age du bronze dans les régions centrales des Balkans," *Godišnjak* (Sarajevo) 21 (1983) 21–26; M. Garašanin, "Grupa Bubanj-Hum III," *Praistorija Jugoslavenskih Zemalja* 4 (1983) 719–22; *Arheološki lokaliteti Bubanj i Velika Humska Čuka* (Niš 1983).

[22] Garašanin (supra n. 19); N. Tasić, "Bubanj-Salcuta-Krivodol kompleks," *Praistorija Jugoslavenskih Zemalja* 3 (1979) 87–117; B. Brukner, "Der Forschungsstand des

this complex are known from Oltenia and western Bulgaria, central and southern Serbia, down to Macedonia and Albania at the same time as latest Vinča. Bubanj Ib (not Bubanj-Hum, since remains of this phase are only found at Bubanj) is equivalent to the Oltenian Cernavoda-Renie II culture. Following this there is a break in the occupation at Bubanj. During this time when Bubanj was not occupied, later Sălcuţa (IIc–IV) pottery is current in Oltenia and Cernavoda I in Muntenia. The gap in the Bubanj ceramic assemblage between Bubanj Ib and Bubanj II occurs at the time when Cernavoda III/Boleraz pottery appears in the north, in other words, during the initial phases of the Baden pottery period.[23] Bubanj remains unoccupied during the time when classic Baden pottery is found on the Hungarian Plain, of which more infra. Occupation of at least part of the site of Bubanj (E. Plateau II/IIa) is next attested during the later Baden-Kostolac period. Bubanj-Hum II is a local Serbian variant of Oltenian late Coţofeni (Coţofeni III), which is probably equivalent to the latest Aeneolithic Vučedol culture on the Hungarian Plain.[24] Finally, Bubanj-Hum III pottery has close ties to the EBA horizon of Armenochori and the late Macedonian Early Bronze Age, as well as with that of the earliest Bronze Age cultures of the Carpathian Basin to the north.[25]

North of the Danube, on the Hungarian Plain, as the Aeneolithic continues, first the Tiszapolgar,[26] and then Bodrogkeresztur cultures develop.[27] It seems likely that they arise from the earlier localized Vinča of the region. They are best known from extensive flat inhumation cemeteries,[28] whose graves contain the occasional copper artifact, as well as pottery.

The Late Copper Age or Chalcolithic of Pannonia and the Hungarian Plain conventionally begins with the Baden culture.[29] Various chronological systems have subdivided this culture's development into two,[30] three,[31] or five[32] phases. Regardless of the number of defined subphases, the earliest, the Boleraz phase, marks a clear break with the Neolithic-derived past. The ceramic assemblage is characterized by channeled or fluted decoration, some finger-impressed bands, handled jugs, and wide conical bowls.[33] Moreover, the first evidence for paired-ox traction in Europe dates to this phase. Boleraz is almost identical in material culture to Cernavoda III, a middle Aeneolithic cultural group whose sites have a middle to lower Danube valley distribution.[34] The mixture of Cernavoda III/Boleraz with autochthonous traditions is considered by many to be the basis for the later Aeneolithic Baden, Kostolac, Vučedol, and Coţofeni cultures,[35] which cover the whole middle Danube drainage.

The changes in material culture that are associated with the beginning of the later Aeneolithic in south-

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Äneolithikums in Ostjugoslawien," *Atti del X simposio internazionale sulla fine del neolitico e gli inizi dell'età del bronzo in Europa* (Verona 1982) 77–97.

[23] V. Nemejcova-Pavukova, "Zur Ursprung und Chronologie der Boleraz-Gruppe," *Badener Symposium* 1973, 297–316; V. Nemejcova-Pavukova, "Nacrt periodizacie Badenskej Kultury a jej chronologickyh uztahov k juhovychodnej Europe," *SlovArch* 29 (1981) 261–96; Tasić (supra n. 20).

[24] N. Tasić, "Coţofeni kultura," *Praistorija Jugoslavenskih Zemalja* 3 (1979) 115–28; P. Roman, *Cultura Coţofeni* (*Biblioteca de Arheologia* 26, Bucharest 1976); P. Roman, *The Late Copper Age Coţofeni Culture of South-East Europe, BAR* suppl. 32 (Oxford 1977); T. Bader, *Epoca bronzului in Nord-Vestul Transilvaniei: cultura pretracica si tracica* (Bucharest 1978).

[25] Garašanin (supra n. 21); N. Tasić ed., *Kulturen der Frühbronzezeit des Karpatenbeckens und Nordbalkans* (Belgrade 1984).

[26] I. Bognar-Kutzian, *The Early Copper Age Tiszapolgar Culture of the Carpathian Basin* (*Archaeologia Hungarica* n.s. 48, Budapest 1972).

[27] A. Sherratt, "The Development of Neolithic and Copper Age Settlement in the Hungarian Plain. Part I: The Regional Setting," *OJA* 1 (1982) 287–316; A. Sherratt, "The Development of Neolithic and Copper Age Settlement in the Great Hungarian Plain. Part II: Site Survey and Settlement Dynamics," *OJA* 2 (1983) 13–41; on chronology relative to other Aeneolithic groups see N. Tasić, "Neue Daten über das relativ-chronologische Verhältnis der frühen äneolithischen Kulturen im jugoslawischen Donauraum," *Balcanica* 16–17 (1985–1986) 7–16.

[28] I. Bognar-Kutzian, *The Copper Age Cemetery of Tiszapolgar-Basatanya* (Budapest 1963).

[29] J. Banner, *Die Peceler Kultur* (*Archaeologica Hungarica* 35, Budapest 1956); N. Kalicz, "Die Peceler (Badener) Kultur und Anatolien," *StArch* 2 (1963); *Symposium über die Entstehung und Chronologie der Badener Kultur* (Bratislava 1973); V. Nemejcova-Pavukova, "Beitrag zu Kennen der PostBoleraz-Entwicklung der Badener Kultur," *SlovArch* 22 (1974); P. Roman and I. Nemeti, *Cultura Baden in Romania.* (*Biblioteca de Arheologia* 31, Bucharest 1978).

[30] S. Dimitrijević, "Prilog stupnjevanju badenske kulture u sjevernoj Jugoslaviji," *Arheološki radovi i rasprave Jugoslavenske akademije znanosti i umjetnosti* 2 (1962).

[31] N. Tasić, *Badenski i vučedolski kulturni kompleks u Jugoslaviji* (Belgrade 1967).

[32] E. Neustupny, "Die Badener Kultur," *Badener Symposium* 1973, 317–52.

[33] A. Sherratt, "The Pottery of Phases IV and V: The Early Bronze Age," in A.C. Renfrew, M. Gimbutas, and E. Elster eds., *Excavations at Sitagroi* I (*Monumenta Archaeologica* 13, 1986) 442.

[34] N. Tasić, *Jugoslovensko Podunavlje od indoevropske seobe do prodora skita* (Belgrade 1983); N. Tasić, "Die Cernavoda III-Kultur und der Zerfall früher äneolithischer Kulturen des Jugoslawischen Donauraums," *Godišnjak* (Sarajevo) 21 (1983) 27–35.

[35] Tasić (supra n. 31) with literature; also Tasić (supra n. 34).

eastern Europe may be seen not only in the ceramic assemblages,[36] but in metallurgy as well.[37] In the ceramics, there is a general similarity among all the cultures of this period: a preference for grey polished fine wares that differ markedly from the earlier painted ware assemblages of the same regions. Another commonality among these ceramic assemblages, despite the confusion of local cultural names, is the new prevalence of cup and small jug shapes. The behavioral correlates of these vessels have been the subject of some discussion. They may be evidence for the first widespread use of milk.[38] When taken together with the first appearance of wheeled vehicles, it is only slightly facetiously that Andrew Sherratt referred to this later Aeneolithic period as a time characterized by "drinking and driving."[39]

AENEOLITHIC/EARLY BRONZE AGE SUBSISTENCE: NOVAČKA ĆUPRIJA

Excavated habitation sites of the latest Aeneolithic/Early Bronze Age transition period are relatively rare; closed contexts that can provide some information about subsistence are even rarer.[40] On the basis of what is still a corpus based largely on unsystematic collection and survey in many regions, it would appear that site sizes and types were more variable than in the earlier parts of the Aeneolithic.[41] Many of the sites are shallow and ephemeral, possibly representing population that was more dispersed over the landscape. Most of these sites have been judged only marginally productive from a traditional archaeological standpoint, because of poor preservation, few features, and a paucity of diagnostic artifacts. Data from such sites, however, may provide as much or more information about the changes in subsistence and lifeways during the later Aeneolithic as those from the less typical but more accessible larger settlements. A good example of such a site from this period is Novačka Ćuprija in the Morava valley, near Smederevska Palanka in central Serbia (fig. 1), which was excavated in 1980 as a joint Yugoslav-American project.[42] Descriptions of the project and its results have been published elsewhere.[43] Three of the trenches at Novačka Ćuprija contained Bubanj-Hum III type material from the very beginning of the Early Bronze Age, found in undisturbed context for the first time in the lower Morava Valley.

Three pits (Pits 1, 2, and 3) of differing dimensions and depths, and traces of a ditch in which was found one of the smaller pits (Pit 3), were discovered in these trenches. As far as can be determined from the ceramic typology, all of these features (i.e., the three pits and the ditch) were contemporaneous, and probably represent the remains of a single partially subterranean architectural feature or house, or the subterranean parts (cellar or storage space) of an above-ground structure. The clear delineation of these closed contexts enhances the importance of the analysis of the botanical, faunal, and artifactual remains.

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[36] Kalicz (supra n. 29).

[37] H. Müller-Karpe, *Handbuch der Vorgeschichte III: Kupferzeit* (Munich 1974); H. Todorova, *Die kupferzeitlichen Axte und Beile in Bulgarien* (Munich 1981).

[38] See Sherratt (supra n. 1) 275–82.

[39] Sherratt (supra n. 1) 263–66; S. Piggott, *The Earliest Wheeled Transport, From the Atlantic Coast to the Caspian Sea* (Ithaca 1983).

[40] Some palaeobotanical and faunal analyses have been published from this approximate time period. Of interest for comparison are the analyses of the Kostolac plant remains from Gomolava (W. van Zeist, "Ugljenisani biljni ostaci na višeslojnom nalazištu Gomolava," *Rad Vojvodjanskih Muzeja* 23–24 [1974–1978], especially table 1); also the material from Ezero (G.I. Georgiev, N.J. Merpert, R.V. Katinčarov, and D.G. Dimitrov, *Ezero: Rannobronzovoto Seliša* (Sofia 1979). (German resume 535–43). Indirect arguments for changed agricultural strategies are given in Champion et al. (supra n. 1) 156–62.

[41] Champion et al. (supra n. 1) 162.

[42] The excavations at Novačka Ćuprija were jointly conducted by Brooklyn College of the City University of New York and the National Museum of Belgrade, Yugoslavia. Excavations were directed by H. Arthur Bankoff and Frederick A. Winter (Brooklyn College) and Dušan Krstić and Mirjana Vukmanović (National Museum). Funding for the project was granted by the National Science Foundation, the National Endowment for the Humanities, the National Geographic Society, and the PSC-CUNY Research Award Program of the City University of New York.

[43] H.A. Bankoff, D. Krstić, M. Vukmanović, and F.A. Winter, "Praistorijski lokalitet 'Novačka Ćuprija'," *Zbornik radova Narodnog Muzeja* 12 (1986) 17–62; H.A. Bankoff and F.A. Winter, "Brooklyn College-Beograd Narodni Muzej Excavations at Novačka Ćuprija 1980," *ArchNews* 10 (1981) 9–12; H.A. Bankoff and F.A. Winter, "The Morava Valley Project in Yugoslavia: Preliminary Report, 1977–1980," *JFA* 9 (1982) 149–64; H.A. Bankoff and F.A. Winter, "The Lower Morava Valley Project," in D.R. Keller and D.W. Rupp eds., *Archaeological Survey in the Mediterranean Area, BAR-IS* 155 (1983) 203–205; H.A. Bankoff and F.A. Winter, "Excavation of Smederevska Palanka, Yugoslavia," *National Geographic Research Reports* 18 (1985) 131–42; H.A. Bankoff, F.A. Winter, and H. Greenfield, "The Culture History of the Lower Morava Valley, Yugoslavia," *Current Anthropology* 21 (1980) 268–69; H. Greenfield, *The Paleoeconomy of the Central Balkans (Serbia)* I: *A Zooarchaeological Perspective on the Late Neolithic and Bronze Age (ca. 4500–1000 B.C.)* (*BAR* 304, 1986); H. Greenfield, "Summary Report on the Vertebrate Fauna from Novačka Ćuprija," *Zbornik radova Narodnog Muzeja* 12 (1986) 63–74.

During the 1980 season at Novačka Ćuprija, one month was spent on intensive recovery of plant remains from exposed contexts.[44] A further period was spent on analysis and identification, as well as on examination of the local flora with a view to comparative work. Among the contemporary flora, most relevant to Novačka Ćuprija were isolated stands representing the original climax vegetation found in the Morava valley. These stands are dominated by oak interspersed with occasional elm and ash, while maple, hawthorn, and wild cherry plum form the understory of shrubs. This is, of course, the situation to be expected on heavy clay-laden soils in Europe such as are typical for the Morava valley. More locally, the north-south valley that runs just to the west of the site is the only exception to what must have been botanically a relatively homogeneous environment. The valley bottom, an area with springs and southward running water, is dominated by marsh species. The ground is wet even in summer, and there is a possibility that standing water existed in the past.

The soil extracted for processing was found to be suitable for flotation.[45] The upper levels of deposit had a very high humus content and took much longer to break down, while the lower levels had a soil that readily dispersed in water, thus releasing charcoal fragments easily. Eighty-six samples were taken during the season, and these represented approximately 3.75 tons of deposit. After processing, samples were dried and sorted. In addition, casts were made from plant impressions in daub to recover evidence of certain plant material not recovered by flotation.

The plant materials recovered (Table 1) include various cereal grains with occasional spikelet fragments in sufficient quantities to establish the presence of different species of wheat: einkorn (*Triticum monococcum*), emmer (*T. dicoccum*), and bread wheat (*T. aestivum*). Three species of cultivated legumes (vetch, peas, and lentils) occur in these pits, and three edible succulent fruits (blackberry, cherry, and plum) that may have been gathered from the surrounding vegetation. Non-cultivated plants include weeds and ruderals, though of more interest is the carbonized wood, representing several different species and throwing light on the ancient climax vegetation.

In the largest pit (Pit 2), which is what remains of the structure (or its subterranean portion), was found the greatest number of botanical remains from the Early Bronze Age. Grains include all three species of wheat, as well as barley and millet. Examples of all the cultivated legumes also were found. In this regard, it is noteworthy that the fruits, which would probably have been collected in smaller quantities than the grains, and consumed soon after their collection, are found only in Pit 2. They are probably therefore in primary context. A certain (i.e., indefinite) amount of this botanical material was connected with the activities within the feature itself (when it existed in its entirety), while the remainder would have been deposited within it at the time of its demolition or destruction, or as a result of activities in the immediate vicinity a short time thereafter.

The neighboring smaller pit (Pit 1) probably served as a storage place for grain (in the EBA) as is indicated by the amount of grain (emmer and einkorn) found within it. Neither legumes nor fruits occur in the samples. The remains of freshwater mussels, rabbit bones, and one human bone in this pit show that it was used secondarily as a garbage pit. Another indication of this pit's use for garbage was the great presence of flint debitage (70% of all debitage found at the site). Pit 3, to the southwest of Pit 2, containing material chronologically indistinguishable from the preceding pits, was almost without botanical remains. The shallower part of the pit, in the shape of a ditch or channel, contained the remains of at least one very large vessel (possibly for holding food or liquid), which had formerly stood, most probably, along the very edge of the pit. Outside of the aforementioned pottery, this pit also contained a pendant worked of dog's tooth and a fragment of a bone needle.

The faunal material from Novačka Ćuprija has been treated at length elsewhere.[46] As might be expected, almost all (97%) of the animal bones found at the site come from domesticated species. Cattle remains were the most numerous, followed by sheep or goat and pigs. It is not possible to tell whether the cattle were being raised for milk or for meat production; at the neighboring Vinča site of Selevac, the latter has been proposed (for a period some 2,000 years earlier than at Novačka Ćuprija).[47] Aside from these domestic animals, bird bones and freshwater mussel shells indicate other sources of animal protein utilized by the Early Bronze Age inhabitants.

Artifactual material from the pits includes pottery, lithics (both finished tools and waste), and worked

[44] This section incorporates, with the permission of the author, much of the report on the plant remains from Novačka Ćuprija by George Willcox.

[45] P.J. Watson, "In Pursuit of Prehistoric Subsistence: A Comparative Account of Some Contemporary Flotation Techniques," *Mid-Continental Journal of Archaeology* 1 (1976) 77–100.

[46] Greenfield (supra n. 43).

[47] A. Legge in Tringham and Krstić (supra n. 6) ch. 5.

Table 1. Botanical Samples

1a. Occurrence of Grains

Context	No. samples	Sample wt (kg)	*monococcum* (einkorn)	*Triticum dicoccum* (emmer)	*aestivum* (bread)	*Hordeum sp.* (barley)	*Panicum miliacum* (millet)
Pit 2	27	1811	47	3	5	24	3
Pit 1	8	500	124	82	1	3	2
Pit 3	3	300	1	1	1	3	-
Totals	**38**	**2611**	**172**	**86**	**7**	**30**	**5**

1b. Occurrence of Legumes

Context	No. samples	Sample wt (kg)	*Vervilia* (bitter vetch)	*Lens culinarus* (lentil)	*Pisum sativum* (pea)
Pit 2	27	1811	10	93	9
Pit 1	8	500	-	-	-
Pit 3	3	300	1	2	3
Totals	**38**	**2611**	**11**	**95**	**12**

1c. Occurrence of Fruits

Context	No. samples	Sample wt (kg)	*Cornus sanginea* (dogwood)	*Rubus fruticosus* (blackberry)	*Cornus mas* (cherry)	*Prunus cerasifera* (plum)
Pit 2	27	1811	1	4	9	3
Pit 1	8	500	-	-	-	-
Pit 3	3	300	-	-	-	-
Totals	**38**	**2611**	**1**	**4**	**9**	**3**

1d. Trees (Presence/Absence)

Context	*Quercus* (oak)	*Ulmus* (elm)	*Corylus* (hazel)	*Carpinus* (hornbeam)	*Crataegus* (hawthorn)	*Fraxinus* (ash)
Pit 2	P	P	P	P	A	A
Pit 1	P	P	P	P	A	P
Pit 3	P	P	P	A	A	A

bone. Pottery comprises by far the most numerous and varied class of artifacts. Utilized and shaped bone tools were found in all three pits belonging to this complex. Again, the assemblage is typologically quite homogeneous, both among the pits and among the units of each individual pit. Awls or needles, probably used for perforating hide, basketry, or woven material, were the most numerous bone implements. In all cases the implement is worked from a sliver of long bone, and has a polished point. The larger examples from Pit 1 may be leather awls; one shows file marks on the point, and rotary wear as from use in drilling is visible on another. Three "spatulas" made of thinned and polished rib bones were also found in Pit 1. A similar-shaped piece from Pit 2 had a perforation in one end, possibly for use as a pendant. Other items that appear more than once are dog-tooth pendants and bird bones possibly used to apply impressed decoration to pottery. Other single implements such as a scapular piece from Pit 1 and a polished horn piece from Pit 2 may have been used for pottery burnishing.

Aside from plant and animal remains, activities connected with food preparation at the site are attested by the presence of grindstone fragments in Pit 2. These fragments indicate that the grindstones were made of metamorphic rock, rectangular, some five to seven centimeters thick, and worn smooth by abrasion on one side. The source of the stone from which these grindstones was made is unknown, but the known sources of such metamorphic rocks point to a probable origin somewhere to the east of the Morava.

Pit 2 had the most varied lithic assemblage of the complex. Stone tool production or resharpening is attested by both stone chips and complete implements (blades and a smaller number of denticulate artifacts), as well as hammerstones. Polished stone axes are also found in this context, as was a stone that may have been used for sharpening them. The total number of chipped stone pieces recovered from all three pits is quite small (33) compared with the amount of pottery (over 4,500 pieces). The common presence of cortex on finished tools may indicate a dearth of good raw materials and the concomitant use of even the smallest and worst pieces of usable flint. Most probably the flint tools were fashioned on pebbles from the nearby rivers; there is no evidence that nodules were obtained from distant sources.

A brief comparison of these data with those of the Late Vinča site of Selevac, some 20 km away, reveals some striking continuities over the approximately 2,000 years that separate the two sites.[48] The palaeobotanical remains from Selevac indicate that, as at Novačka Ćuprija, einkorn was found more frequently than emmer wheat. Bread wheat (*T. aestivum*), which was absent from the Selevac samples, perhaps as a result of sampling error, occurs in small quantities in the Novačka Ćuprija inventory. Barley occurs much more frequently at Novačka Ćuprija, although there is no indication of whether it was hulled (as at Selevac) or naked, two-row or six-row type. Broomcorn millet (*Panicum miliacum*) is unknown from Selevac, although found at other contemporaneous sites, and might have been used for making leaven or a fermented drink at Novačka Ćuprija.[49] In both sites, peas and lentils are represented, and similar fruits were gathered. The absence of bitter vetch is anomalous at Selevac, compared with other sites of the time.

Artifact categories other than ceramics confirm the impression of similarity between the two sites. Bone artifacts, although fewer in types and numbers at Novačka Ćuprija than at Selevac, appear to have been constructed and used in the same fashion.[50] Novačka Ćuprija contains no new types of bone tools, and lacks the antler inventory of Selevac. This may be due to sampling error at the later site, since large numbers of antler tools in finished and unfinished condition are known from other Serbian EBA sites such as Ljuljaci.[51] The paucity of antler, and of deer remains in general at Novačka Ćuprija,[52] might also reflect an actual drop in the deer population and in the importance of hunting around this site in the latest Aeneolithic/EBA period.

In general, then, subsistence activities as reflected in the faunal, floral, and lithic remains do not seem to indicate any great differences between the Late Aeneolithic/EBA at Novačka Ćuprija and the Early Aeneolithic Vinča site of Selevac. The most striking differences between the sites relate to the possible social organizational and population changes. At Selevac Chapman posits a population range of 120–240 people for the early period of the site, with the possibility of as many as 600–1,200 inhabitants during the late phase.[53] Nothing at Novačka Ćuprija gives any evidence of habitation by more than a few extended families, comprising 50–100 people at most. This small settlement size would appear to be a heri-

[48] Selevac data is from F.S. McClaren and R.N.L.B. Hubbard in Tringham and Krstić (supra n. 6) ch. 6.

[49] J. Renfrew, *Palaeoethnobotany* (London 1973) 101.

[50] Selevac data from N. Russell in Tringham and Krstić (supra n. 6) ch. 14.

[51] M. Bogdanović, *Etnokulturna kretenja u centralnoj Srbiji u bakarno i bronzano doba* (Belgrade 1983) 78–83.

[52] See Greenfield (supra n. 43).

[53] J. Chapman in Tringham and Krstić (supra n. 6) ch. 2.

tage of the Middle to Late Aeneolithic, if one can judge from the extent of Baden and Kostolac settlement at such sites as Gomolava.[54] Even large villages of the earliest Bronze Age in the Morava drainage, such as Ljuljaci, with some 29 excavated houses,[55] do not approach the nucleation of settlement seen at Selevac. At Novačka Ćuprija, and other sites in southeastern Europe after the Middle Aeneolithic, smaller groups of people could (and in most cases did) live as well or better than those larger groups living at the earlier settlements. At least some of the activities that had been the responsibility of supra-familial groups now were able to be taken care of by smaller household groups.

CHRONOLOGY

The relative chronology of the later Aeneolithic and earliest Bronze Age of the Morava valley, as exemplified by the assemblage from Novačka Ćuprija, can be tied into the stratified sequences available for this time period in southeastern Europe, especially the sites of Baile Herculane in Oltenia,[56] Ezero in Bulgarian Thrace,[57] and Sitagroi in northeastern Greece.[58] This is shown in simplified form in Table 2. Several points deserve special mention. Horizons VIII–III of Ezero can be related to Troy I and Poliochni "blue" and "green."[59] They are thus "Early Bronze Age" in Aegean terms, although, as in the Morava valley sites, there is nothing in the metal inventory or analyses to distinguish these levels from the Aeneolithic or Chalcolithic levels on many other tells. According to Garasănin, Horizons XIII–VIII (and possibly VII–V), which he equates with Troy I, contain pottery with similarities to Cernavoda III/Boleraz, while Horizon III contains classic Baden analogues.[60] According to Sherratt,[61] there is a hiatus in the Bulgarian sequence during the Cernavoda III/Boleraz period, while Early Ezero (Horizons XIII–VIII) is contemporaneous with classic Baden. The Sitagroi sequence should connect the Morava valley sequence more directly with the Aegean. The ceramic inventory from Sitagroi Va and Vb, especially the latter, resembles the pottery from the Novačka Ćuprija pit complex quite closely. Again, this corresponds to Troy I or early II, or EH II in the Aegean, as does the single-handled cup from Aghios Kosmas with Baden similarities.

It remains for us to put this material into an absolute chronological framework. In the last 35 years, archaeologists have become increasingly dependent on radiocarbon dates for the creation of the temporal framework upon which the study of cultural development rests. The effect of radiocarbon dating on theory and interpretation in European archaeology has been most marked in Neolithic and Early Aeneolithic studies.[62] The acceptance of a radiocarbon-based higher chronology for the inception of these periods allows a longer period of time for the development of agriculture and related Neolithic developments. The high chronology in turn, has led to a reconsideration of the importance of diffusion from the Near Eastern/Aegean area in the cultural dynamics of continental Europe during the Neolithic and Aeneolithic periods, and a recognition of this region's independence and vitality.[63] While radiocarbon dating has not been without its opponents, its rejection can no longer seriously be considered.[64]

Despite these developments in radiocarbon dating, and although not as true as it was 15 years ago, chronological reasoning in southeastern Europe is still

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[54] J. Petrović, "Enéolithique moyen et tardif à Gomolava," in N. Tasić and J. Petrović eds., *Gomolava; Cronologie* [sic] *und Stratigraphie der vorgeschichtlichen und antiken Kulturen der Donauniederung und Sudosteuropas* (Novi Sad 1988) 39–46.

[55] Bogdanović (supra n. 51) 62.

[56] S. Marinescu-Bilcu, *Cultura precucuteni pe teritorul Rominiei* (Institutul de Arheologie 22, Bucharest 1974); V. Dumitrescu, "The Prehistory of Romania: From the Earliest Times to 1,000 B.C." *CAH* III, 1 (1982) 1–74.

[57] Georgiev et al. (supra n. 40).

[58] A.C. Renfrew, "Sitagroi and the Prehistory of South-East Europe," *Antiquity* 45 (1971) 275–82; Renfrew, Gimbutas, and Elster eds. (supra n. 33).

[59] Georgiev et al. (supra n. 40); A.F. Harding in A.G. Poulter, *Ancient Bulgaria: Papers Presented to the International Symposium on the Ancient History and Archaeology of Bulgaria, University of Nottingham, 1981* (Nottingham 1983).

[60] Garašanin (supra n. 15).

[61] A. Sherratt in Renfrew et al. (supra n. 58) 445.

[62] E. Neustupny, "Absolute Chronology of the Neolithic and Aeneolithic Periods in Central and Southeastern Europe, I," *SlovArch* 16:1 (1968) 19–60; E. Neustupny, "Absolute Chronology of the Neolithic and Aeneolithic Periods in Central and Southeastern Europe, II," *Archeologicke Rozhledy* 21 (1969) 783–810; E. Neustupny, "Der Übergang vom Neolithikum zum Äneolithikum und der Ausklang der Lengyel-Kultur," *Studijne Zvesti* (Nitra) 17 (1969) 271–92; A.C. Renfrew, "The Autonomy of the South-East European Copper Age," *PPS* 35 (1969) 12–47; A.C. Renfrew, "The Tree-ring Calibration of Radiocarbon: An Archaeological Evaluation," *PPS* 36 (1970) 280–311; A.C. Renfrew, *Before Civilization* (New York 1973).

[63] Renfrew 1973 (supra n. 62).

[64] See Ehrich and Bankoff (supra n. 2); Evans and Rasson (supra n. 2) 716; for an opposing view of the validity of radiocarbon dates see J. Bouzek, *The Aegean, Anatolia, and Europe: Cultural Interrelations in the Second Millenium B.C.* (Göteborg 1985) 19, 244.

based firmly in a seriational and typological methodology that ties the area tightly to Central Europe and indirectly to the historical sequences of the Near East. Any discussion of the absolute chronology of the southeastern European late Aeneolithic and Bronze Age must begin, therefore, with an analysis of the basis for the absolute dates for our terminus ante quem, the Bronze Age of Central Europe.

Absolute Chronology of the Later Prehistoric Periods in Central Europe

Since the Central European Bronze Age falls within the historic period in Egypt and the Near East, cross-dated chains of synchronisms and externally and internally consistent stratigraphic sequences may be connected with Egyptian historical dates.[65]

Egyptian historical dates are dependent on several astronomically datable events recorded as occurring in specific regnal years.[66] Theoretically, the historical Egyptian chronology can be tied into that of the European Bronze Age through correlations at three temporally distinct points: a) the Early Bronze Age metal inventory; b) the Shaft Graves at Mycenae and their connections with the European Middle Bronze Age; c) the horizon of new metal types marking the beginning of the Late Bronze Age.[67] It is this earliest correlation point that concerns us here.

The use of Egyptian dates for European Bronze Age events is, however, fraught with difficulties. No Egyptian artifacts have ever been found in prehistoric contexts in Europe outside the Mediterranean. Non-Aegean prehistoric European artifacts are not found in Egypt. The Egyptian dates, therefore, are associated with Egyptian assemblages that are in turn used to date other non-Egyptian assemblages in which European artifacts or artifact types considered to be related to them occur. This, of course, is the most problematic kind of extended cross-dating. Disagreement over the length of time necessary for the diffusion and acceptance of an artifact type or the duration of its use adds an uncertainty factor to this kind of cross-dating that may be almost as large as that of the standard deviation in a radiocarbon date, although in the case of cross-dating, the uncertainty is usually less explicitly stated and occasionally not even recognized.

The Central European Early Bronze Age

In theory then, the Early Bronze Age metal inventory and its Aegean analogues should give a date for the beginning of the central and (by extension) southeastern European Early Bronze Age. Traditional cross-dating between the Egyptian/Mediterranean historical sequence and the central and southeastern European Early Bronze Age places the inception of this period to slightly after 2000 B.C.[68] According to Gimbutas

> "almost all metal artifacts used by the . . . [cultures of the EBA of the middle Danubian southern Hungarian Plain] and imitated by their northern neighbors have analogies or prototypes in the Near East between Egypt and northern Iran, the most numerous and closest parallels being along the Syrian-Palestinian coast and on Cyprus. These are: neck-rings with rolled ends, curved-shank pins with knot heads called Cypriote pins, or with simple spiral or loop heads, sheet-metal belt-plates with rolled ends and embossed decoration, cylinders wound of thin copper wire, double wire spirals, earrings with flattened ends, plain spiral bracelets, and double spiral pendants."[69]

Such metal objects typify the inventory of Reinecke's Bronze A1 period in central Europe, as well as the earliest EBA graves in the south Hungarian cemeteries and the Moris culture of the Yugoslav Banat.[70] Similar metal types, including ring ingots characteristic of a developed phase of the Central European EBA (Reinecke Late Bronze A1), occur at the sites of Byblos, Ras Shamra, Hama, and Tell As

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[65] P. Åström, *High, Middle or Low?* (Acts of an International Colloquium on Absolute Chronology Held at the University of Gothenburg 20–22 August 1987) (Gothenburg 1987).

[66] The earliest such astronomically fixed point in Egyptian history is 1872 B.C. (W.C. Hayes, "Chronology: Egypt to End of Twentieth Dynasty," *CAH* I [1970] 174) or possibly 1830 B.C. (R. Krauss, *Sothis- und Monddaten, Studien zur astronomischen und technischen Chronologie Altägyptens* (*Hildesheimer Ägyptologische Beiträge* 20, 1985) 73; see also K.A. Kitchen, "The Basics of Egyptian Chronology in Relation to the Bronze Age," in Åström (supra n. 65) 43–44. Documentary evidence (lists of the pharaohs and the duration of their reigns) allows the calculation that 3114 B.C. was the absolute date for the beginning of the First Dynasty. Early New Kingdom dates are pegged to an astronomical event at 1537 B.C. (Hayes, op. cit., 183) or 1517 B.C. (Kitchen, op. cit., 42), while several Sothic and lunar dates allow the absolute dating of the reigns of the pharaohs of the 19th and 20th Dynasties to within a decade throughout the 15th through 12th centuries B.C.

[67] M. Gimbutas, *Bronze Age Cultures in Central and Eastern Europe* (The Hague 1965) 33; See also Coles and Harding (supra n. 2) 379; A.F. Harding, "Radiocarbon Calibration and the Chronology of the European Bronze Age," *Archeologicke Rozhledy* 32 (1980) 178.

[68] E. Neustupny, "Absolute Chronology of the Bronze Age in Central Europe," *Istraživanja* (Novi Sad) 5 (1976) 111–16.

[69] See Gimbutas (supra n. 67) 32–33.

[70] B. Brukner, B. Jovanović, and N. Tasić, *Praistorija Vojvodine* (Novi Sad 1974) 190.

Table 2. Cultural Sequences/Chronology of Southeastern Europe

DATE B.C.	Middle Danube HUNGARIAN PLAIN	Middle Danube VOJVODINA/ N. SERBIA	Lower Danube MORAVA/N.W. BULGARIA	Lower Danube TRANSYL-VANIA	Lower Danube OLTENIA	Lower Danube E. BULGARIA	Lower Danube DOBRUDJA
2000		Vatin		Verbi-			
2100				cioara	Glina III		
2200	Nagyrev	Maros			/Schneck-		
2300	Vinkovci/		Bubanj-Hum III		enberg	Late	
2400	Mako	Vučedol				Ezero	
2500	Vučedol/Zok						
2600			Bubanj-Hum II				
2700							
2800	Late Baden	Kostolac				Middle	Ezero
2900			Bubanj			Ezero	
3000			(EPlat II)				
3100					Coţofeni		
3200	Classic	Classic			IIIb/c		
3300	Baden	Baden		Coţofeni	Coţofeni		
3400					II/IIb		
3500						Early	
3600	Boleraz	Boleraz/		III		Ezero?	Cernavoda
3700		Cernavoda		Cernavoda			
3800	Bodrog-	III		I			
3900	keresztur	Sălcuţa IV	Bubanj Ib				
4000				Cucuteńi B	Sălcuţa IV		
4100	Tiszapolgar						
4200						(Varna)	Gumelniţa
4300					Sălcuţa III		
4400	Tisza/	Vinča (Late)					
4500	Herpaly		Bubanj-Hum Ia/Krivodol	Cucuteńi (SE Tran)	Sălcuţa IIb, IIc	Karanovo VI	

on the eastern edge of the Mediterranean in contexts dated to the Egyptian X–XI Dynasty, about 2100 B.C. Quoting Gimbutas again for the traditional view of the chronology and cultural dynamics:

> "There is no doubt that the ornaments just mentioned . . . first were made in the Near East and then were distributed to eastern central Europe, as they are dated at a much earlier period in the Near East, many of the prototypes reaching the middle of the third millennium B.C."[71]

This is, as we said, a traditional and now outmoded view, stressing the passive role of Europe as opposed to the innovating active role of the Near East.

Southeastern Europe: Aeneolithic to Early Bronze Age

As in the case of earlier Neolithic chronology, where historically derived dates are not possible, one looks to physics for help in establishing the absolute dates. The radiocarbon chronology for the later Neolithic period in southeastern Europe is reasonably well established.[72] Dates for final Vinča levels cluster in the second half of the fifth millennium B.C. The dates for the succeeding Aeneolithic period are rarer, but do exist (Table 3). In Oltenia, two dates place Sălcuţa IIb and IIc, which should correspond to the end of the Bubanj-Hum Ia period in the Morava valley and Serbia,[73] to between 4425 and 4305 B.C. in calendar years. Coţofeni II/IIb at Baile Herculane has an average date of 3370–3040 B.C., while dates from this site and Ostrovul Corbului give an average date of 3160–2910 B.C. for Coţofeni IIIb/c or Coţofeni with latest Baden (Kostolac and Vučedol) elements. This

[71] Gimbutas (supra n. 67) 34.

[72] Ehrich and Bankoff (supra n. 2).

[73] Garašanin (supra n. 19) 190; Garašanin 1983 (supra n. 21) 165.

would be equivalent to Bubanj-Hum II in the Morava valley sequence.[74] Elsewhere Garašanin equated Coţofeni III with Bubanj-Hum Ib.[75]

Final Baden, contemporaneous with Baden/Kostolac and Vučedol,[76] elements are therefore found in the Oltenian assemblage of within 200 years of 3000 B.C. In Hungary, this corresponds well to dates for Baden-Pecel with Kostolac elements from Oszentivan, and an Ocher Grave burial above a Bodrogkeresztur settlement at Ketegyhaza. The same date is suggested for Baden-Kostolac by a date from Pivnica in northern Bosnia, several dates from Hissar in Kosovo, and for the transition from Baden to Kostolac at Gomolava in Srem (eastern Croatia).[77] Further afield, a series of 27 dates from Ezero[78] date the Bulgarian horizons equivalent to Baden and Baden/Kostolac (Bubanj-Hum II) to between 3150 and 2900 B.C. Dates for Vučedol from Hrustovaka and Koprivička Rijeka in northeast Croatia suggest that this period can be set between 2900 and 2700 B.C.

Slag from a Baden context in Trench 40 at Novačka Ćuprija suggests that the use of arsenical bronze began by the late fourth millennium B.C.[79] Although traditionally Baden is considered to be late Aeneolithic, this is another example of the strong continuity or even unity between the later Aeneolithic and the Bronze Age. If one cares about retaining the terminology, it would not be inconsistent to include Baden as the beginning of the Early Bronze Age in southeastern and central Europe. The radiocarbon dates from Novačka Ćuprija suggest that the traditional Early Bronze Age in the Morava valley (Bubanj-Hum III) began by the mid-third millennium B.C. The dates from Sitagroi IV, Va, and Vb provide confirmatory evidence.[80] New evidence from the Morava valley and from Vinča can be used to define a "proto-Vatin" phase of the Early Bronze Age in the Vojvodina, which should date to around 2000 B.C. This phase marks the end of the late Aeneolithic/EBA sequence in this area. Dates for the beginning of the Middle Bronze Age suggest that the transition from Early to Middle Bronze Age in both central and southeastern Europe cannot be far from 1850 B.C. These dates accord well with the high chronology for central Europe.[81]

GENERAL OBSERVATIONS

The chronology constructed on the basis of the radiocarbon dates now available for southeastern Europe emphasizes the length of the Aeneolithic and the earlier inception of the Early Bronze Age. In other words, the radiocarbon chronology expands the duration of the earlier chronological phases, while basically leaving the later part of the Bronze Age its traditional length. Like the similar results of the radiocarbon-based absolute chronology of the Neolithic and earlier Aeneolithic periods, this has ramifications in terms of the interpretation of the evidence and cultural dynamics. For example, if the radiocarbon chronology is correct, the "Anatolian" and "Near Eastern" metal types of the European Early Bronze Age may be as early or earlier in Europe than in the Levant. Considering the metallurgical history of the southern Carpathians, this is not surprising. Extensive copper mines at Rudna Glava in East Serbia date to the Vinča-Pločnik phase of Early Aeneolithic in the late fifth millennium B.C.[82] Pottery of similar date is also associated with the large mines at Aibunar, near Karanovo in Bulgaria.[83] These early centers, as well as others in Romania and East Slovakia, provided the raw material for the manufacture of the massive copper axes and axe-adzes of the earlier European Aeneolithic.[84] This tradition of copper smelting continued in the middle Danube region throughout the Aeneolithic, although the evidence is at present scanty. The aforementioned copper slag from a Baden context at Novačka Ćuprija indicates the continuity of a crucible smelting technology or technique

[74] Garašanin (supra n. 19).

[75] Garašanin (supra n. 19) 224; Garašanin, Niš 1983 (supra n. 21) 167.

[76] Tasić (supra n. 31); Tasić (supra n. 34); Nemejcova-Pavukova (supra n. 23).

[77] H.T. Waterbolk, "C14-Datirungen von Gomolava," in Tasić and Petrović (supra n. 54) 119.

[78] H. Quitta, "Radiovugerodni dati i tri hronologiceski sistemi," *Interdisciplinarni Izsledvanija* (Sofia) 1 (1978) 12–24; H. Quitta and G. Kohl, "Neue Radiocarbondaten zum Neolithikum und zur frühen Bronzezeit Südosteuropas und der Sowjet-union," *ZfA* 3 (1969) 223–55.

[79] P. Glumac, *The Advent of Metallurgy in Prehistoric South-east Europe* (Diss. Univ. of California, Berkeley 1990).

[80] See Sherratt (supra n. 33) 443.

[81] See Neustupny (supra n. 62).

[82] B. Jovanović, *Metalurgija eneolitskog perioda Jugoslavije* (Belgrade 1971); B. Jovanović, "Rudarstvo i metalurgija eneolitskog perioda Jugoslavije," *Praistorija Jugoslavinskih Zemalja* 3 (1979) 27–85; B. Jovanović, *Rudna Glava: Najstarije rudarstvo bakra na centralnom Balkanu* (Belgrade 1982).

[83] E.N. Chernykh, *Gornoe delo i metallurgija v drevnejsej Bolgarii* (Sofia 1978); E.N. Chernykh, "Metallurgical Provinces of the Fifth and Second Millennium in Eastern Europe in Relation to the Process of Indo-Europeanization," *Journal of Indo-European Studies* 8 (1980) 317–36.

[84] A. Sherratt, "Resources, Technology and Trade in Early European Metallurgy," in G. Sieveking et al. eds., *Problems in Economic and Social Archaeology* (London 1976) 557–82.

Table 3. Selected Radiocarbon Dates from the Later Aeneolithic/Early Bronze Age of Southeastern Europe

Area	Culture	Site	Lab. no.	Date B.P. (5568 hl)	Calibrated date (MASCA/Michaels) (1 sigma range)
Oltenia	Sălcuţa IIb	Sălcuţa 2	GrN-1990	5475 ± 55	4425–4320
	Sălcuţa IIc	Sălcuţa 1	GrN-1989	5450 ± 55	4420–4120
		Sălcuţa 1	GrN-1985	5450 ± 55	4420–4120
Hungarian Plain	Tiszapolgar	Tiszapolgar-Csoszhalom	Bln-510	5870 ± 100	4960–4565
			Bln-512	5775 ± 100	4745–4535
			Bln-509	5575 ± 100	4550–4380
		Tiszapolgar-Basatanya	Deb-348	5020 ± 180	3960–3650
			Deb-348?	5060 ± 170	3960–3755
			Deb-122	4850 ± 150	3865–3495
			Deb-361	5350 ± 190	4425–3890
			Deb-214	4980 ± 140	3905–3650
Averages: Tiszapolgar-Csaszhalom				**5740 ± 60**	**4785–4540**
Tiszapolgar-Basatanya				**5050 ± 75**	**3920–3765**
Hungarian Plain	Bodrogkeresztur	Tiszapolgar-Basatanya	Deb-5	4960 ± 130	3830–3645
			Deb-4	4820 ± 140	3795–3485
Oltenia	Coţofeni IIb	Baile Herculane	LJ-3533	4460 ± 80	3370–2970
		Ostrovul Corbului	LJ-3797	4520 ± 60	3375–3145
	Coţofeni III		LJ-3798	4360 ± 50	3170–2910
			LJ-3799	4360 ± 60	3170–2910
		Baile Herculane	LJ-3535	4350 ± 60	3165–2905
			LJ-3534	4360 ± 100	3180–2895
			LJ-3536	4300 ± 60	3055–2885
Averages: Coţofeni IIb				**4490 ± 50**	**3370–3040**
Coţofeni III				**4346 ± 30**	**3160–2910**
Pannonia	Baden	Oszentivan	Bln-476	4515 ± 80	3380–3035
	Baden	Vučedol	Z-1446	4540 ± 100	3395–3025
			Z-1617	4500 ± 100	3375–3020
			Z-1619	4400 ± 100	3360–2910
			Z-1618	4300 ± 100	3155–2870
	Baden	Gomolava	GrN-13168	4380 ± 70	3175–2920
Average: Baden				**4440 ± 40**	**3360–2995**

which first appeared in the Morava valley at Selevac, some 1,500 years earlier.[85] As at Selevac, this slag implies that the raw materials, in the form of ores, were transported to be smelted in the river-valley sites at some distance from the ore sources. The slag from Novačka Ćuprija, unlike that from Selevac, is of arsenical copper. According to Petar Glumac, the elemental analysis of the copper metal in the Novačka Ćuprija slag accords well with that of a Baden axe found in a house overlain by a tumulus at Jabuka Tri Humke. The arsenic, lead, and zinc impurities would seem to indicate that the Baden people at Novačka

[85] P. Glumac, "An Archaeometallurgical Study of the Material from Selevac," *Zbornik radova Narodnog Muzeja u Beogradu* 11 (1983) 135–41; P. Glumac and J. Todd, "New Evidence for the Use of Lead in Prehistoric South-East Europe," *Archeomaterials* 2 (1987) 29–37.

Area	Culture	Site	Lab. no.	Date B.P. (5568 hl)	Calibrated date (MASCA/Michaels) (1 sigma range)
Hungarian Plain	Ocher Grave	Ketegyhaza	Bln-609	4265 ± 80	3045–2790
	Bell Beaker	Csepel Island	Bln-1221	4235 ± 100	3025–2775
			Q-1122	4170 ± 90	2930–2640
W. Balkans	Kostolac	Pivnica	KN-145	4110 ± 160	2915–2530
Pannonia	Kostolac	Gomolava	GrN-7371	4360 ± 60	3170–2910
			GrN-7372	4445 ± 70	3360–2995
			GrN-13167	4210 ± 60	2935–2785
Average: Kostolac				**4280 ± 40**	**3040–2880**
E. Balkans		Ezero	average		
		(27 dates)	Ezero A	4336 ± 25	3150–2900
			Ezero B	4355 ± 25	3160–2910
W. Balkans	Vučedol	Hrustovaka	Bln-564	4125 ± 80	2900–2615
Pannonia		Vučedol	Z-1637	4300 ± 100	3155–2870
			Z-1621	4300 ± 100	3155–2870
			Z-1447	4290 ± 120	3150–2865
			Z-1453	4290 ± 120	3150–2865
			Z-1624	4200 ± 100	2980–2655
			Z-1449	4190 ± 120	2950–2650
			Z-1454	4130 ± 120	2905–2625
			Z-1622	4100 ± 100	2890–2540
Average: Vučedol				**4215 ± 35**	**2935–2785**
Macedonia	EBA	Sitagroi IV/Va average (9 dates)		4380 ± 30	3170–2925
		Sitagroi Vb average (6 dates)		3950 ± 35	2640–2390
C. Europe	Unětice (EBA)	Prasklice	Bln-475	3845 ± 80	2415–2185
		Vikletice	GrN-9378	3760 ± 35	2320–2135
Hungarian Plain	Nagyrev	Dunaujvaros	Bln-340	3735 ± 80	2330–1975
		Toszeg	GrN-6653	3685 ± 35	2185–1970
	Moriš	Mokrin	nn	3500 ± 50	1960–1725
Morava Valley	Bubanj-Hum III	Novačka Ćuprija	Beta-14789	3910 ± 100	2635–2300
			BC-84	3590 ± 100	2160–1850
			Beta-2574	3300 ± 90	1745–1520
		Crkvina	BC-68	3990 ± 60	2650–2520

Ćuprija were smelting sulfide ores. The utilization of the sulfide ores of central Europe begins with the inception of the Bronze Age, now dated by the radiocarbon chronology to roughly the mid-third millennium B.C.

The assemblages of the central European Early Bronze Age are dominated by several spectrographically distinct metal groups,[86] among which the so-

[86] S. Junghans, E. Sangmeister, and M. Schröder, *Metallanalysen kupferzeitlicher und frühbronzezeitlicher Bodenfunde aus Europa* (Berlin 1960); S. Junghans, E. Sangmeister, and N. Schroder, *Kupfer und Bronze in der frühen Metalzeit Europas* (Berlin 1968).

called "Ösenhalsring" metal,[87] possibly from a Slovakian[88] or an Alpine source,[89] is known from hoards containing large quantities of these ring-ingots. Examples found in the Levant might indicate that both semi-finished raw materials and European finished products were finding their way in small quantities into the international market. Their contexts in the Levant could then corroborate the radiocarbon dates by providing a terminus ante quem for their occurrence in Europe.

The later part of the Aeneolithic in the Morava Valley, as in the rest of southeastern Europe, gives ample evidence of changes in material culture, settlement pattern, and perhaps subsistence. We have already noted the new ceramic inventory and the disappearance of the earlier Neolithic tradition of painted wares. The large nucleated settlements also disappear. Most of the long-established tell settlements of the eastern Balkans are abandoned as well.[90] The settlements of the later Aeneolithic are usually characterized as short-lived, shallow, disturbed, or ephemeral. It is not until well into the Early Bronze Age that larger apparently stable tell-like sites are again found on the Hungarian Plain and in Bulgaria. The appearance of the horse, animal traction, plows, and carts, all certainly associated with changes in agricultural technology and probably with socio-economic changes,[91] have been dated to this later Aeneolithic period.[92] As noted above in connection with the new pottery types, Sherratt has claimed[93] that raising cattle for milk and sheep for wool is also to be traced to this time.

Traditionally, these changes and others including inhumation under tumuli, pit graves, and corded pottery, have been ascribed to invasions of nomadic pastoralists from the Russian steppes.[94] These hypothetical nomads assume more importance to many as the first Indo-European speakers to burst onto the European scene. The question of whether we can see any regular relationships between language change, population change, and material culture change has generally been ignored.[95] If this later Aeneolithic period is as long as we have proposed, full of socioeconomic change, inter- and intra-group competition, and regional and inter-regional contact, then there is ample reason to suppose that language change may have played an integral part in these processes. Given the long time over which the transformations of the Aeneolithic took place, language shift is hardly an unreasonable expectation. We should note in this context that Renfrew[96] has recently proposed that the first Indo-Europeans, whose homeland he places in eastern Anatolia, arrive in Europe by 6500 B.C. We have deliberately avoided mention of the whole Indo-European problem, which appears to us (in its classic form) to be quite possibly insoluble.

It is, however, an example of a wider, more basic problem. One of the most basic assumptions underlying archaeological work in southeastern Europe is that the *perceived* rate of cultural or assemblage change is of great importance, in most cases determining the way that change is explained. If the change is perceived as slow and incremental, it is explained as local autochthonous development; if perceived as sudden, it betokens the intrusion of a new group (usually thought of as a new ethnic group).[97] These implicit assumptions about the relationship of rates and causes of cultural change help to explain the continuing primacy of chronological investigations in southeastern European archaeology.

According to the chronology presented here, approximately two millennia exist for the transformation of the Neolithic village-farming socioeconomic pattern into a uniquely European temperate farmstead pattern, with the concomitant changes in society and subsistence. Such changes involved not only the

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[87] H.T. Waterbolk and J.J. Butler, "Comments on the Use of Metallurgical Analysis in Prehistoric Studies," *Helinium* 5 (1965) 227–51.

[88] B. Bath-Bilkova, "K problemu puvodu hriver—Zur Herkunftsfrage der Halsringbarren," *Pamatky Archeologicke* 64 (1973) 24–41.

[89] H. Neuninger and R. Pittioni, "Frühmetallzeitlicher Kupferhandel im Voralpenland," *ArchAustr* Beiheft 6 (1963) 1–39.

[90] R. Dennell, *Early Farming in South Bulgaria from the VI to the III Millennia B.C.* (*BAR-IS* suppl. 45, 1978).

[91] Champion et al. (supra n. 1) 156–62; D. Anthony, "The 'Kurgan Culture,' Indo-European Origins and the Domestication of the Horse: A Reconsideration," *Current Anthropology* 27 (1986) 291–313.

[92] Sherratt (supra n. 1).

[93] A. Sherratt, "The Secondary Exploitation of Animals in the Old World," *World Archaeology* 15 (1983) 90–104.

[94] See Gimbutas (supra n. 67); M. Gimbutas, "The First Wave of Eurasian Steppe Pastoralists into Copper Age Europe," *Journal of Indo-European Studies* 5 (1977) 277; Tasić (supra n. 35); H. Thomas, "Archaeological Evidence for the Migrations of the Indo-Europeans," in E. Polomé ed., *Linguistica Extranea* 14 (Ann Arbor 1982) 61–86; N. Tasić, "Das Problem der sukzessiven Migrationen während des Aeneolithikums in Karpaten-Donautal-Balkan-Gebiet," *ArchJug* 22–23 (1982–1983) 15–20.

[95] D. Anthony and B. Wailes, rev. of Renfrew (infra n. 96) *Current Anthropology* 29 (1988) 441–45.

[96] A.C. Renfrew, *Archaeology and Language: The Puzzle of Indo-European Origins* (London 1987).

[97] Evans and Rasson (supra n. 2) 718.

gradually felt effects of continued agricultural expansion, combined with the probable synergistic effects of increased animal husbandry and grazing, local factors such as increasing soil salinity on the Hungarian Plain,[98] and transport technology perhaps derived from further east,[99] but also possibly the increased viability of the household as the basic unit of production.[100] Many of these changes may be related to the intensifying effects of sedentism on economic and social relations.[101] As Anthony and Wailes put it,[102] without declaring later prehistoric Europe "a migration-free zone on theoretical grounds," it seems to us that the need to invoke migration to explain the changes is a facet of our perceptual difficulty. Part of the problem may go back to our traditional archaeological paradigm of the Three Age System, in which the Aeneolithic, which in fact consisted of 2,000 years of change, has been too often perceived as a fleeting transitional phase, a point in time, rather than a long period in which technological and social changes that were long in coming arrived at a point at which they were archaeologically visible.

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[98] A. Sherratt, "Mobile Resources: Settlement and Exchange in Early Agricultural Europe," in A.C. Renfrew and S.J. Shennan eds., *Ranking, Resources, and Exchange* (Cambridge 1982) 13–26.

[99] Anthony (supra n. 91).

[100] Tringham and Krstić (supra n. 6).

[101] T. Kaiser and B. Voytek, "Sedentism and Economic Change in the Balkan Neolithic," *Journal of Anthropological Archaeology* 2 (1983) 323–53.

[102] See Anthony and Wailes (supra n. 95) 444.