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MUZEUL NAŢIONAL AL UNIRII ALBA IULIA
510010 ALBA IULIA
Str. Mihai Viteazul, 12-14
Tel. 0258/813300

Mailing address:
MUZEUL NAŢIONAL AL UNIRII ALBA IULIA
RO – 510010 ALBA IULIA
12-14, Mihai Viteazul St.
Tel. (+40) (258) 813300

redactie@revista-apulum.ro

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ARCHAEOLOGICAL INVESTIGATIONS AND RADIOCARBON DATING OF THE MULTIPERIOD SETTLEMENT AT STREMȚ - *FABRICA DE ALCOOL*

Colin P. QUINN
University at Buffalo, Buffalo, NY, USA
Horia Ion CIUGUDEAN
Muzeul Național al Unirii Alba Iulia, Romania

Cuvinte-cheie: bronz mijlociu, cultura Wietenberg, bronz târziu, date radiocarbon
Key words: Middle Bronze Age, Wietenberg culture, Late Bronze Age, radiocarbon dates

Introduction

The Bronze Age in southwest Transylvania was an important time of social, economic, and political transformation. Southwest Transylvania has abundant natural resources, especially metal and salt deposits, that were important parts of Bronze Age economies across Europe[1]. In addition to mineral resources, Bronze Age communities in southwest Transylvania had the ability to produce a wide range of agropastoral products, construction materials, and fuel – some of which would have been more difficult to find in other parts of the Carpathian Basin at this time[2]. Understanding what life was like for Bronze Age communities in southwest Transylvania can shed light on how people experienced and participated in the broader transformations that mark the European Bronze Age.

In 2011, a team of American and Romanian archaeologists initiated a research project designed to document the lifeways of Bronze Age communities within the contemporary boundaries of Alba County. The Bronze Age Transylvania Survey (BATS) Project is a collaborative international research partnership between the University at Buffalo, USA and the National Museum of the Union, Alba Iulia. Previous institutional sponsors include the University of Michigan, USA and Hamilton College, USA.

The primary aims of the project were to identify Bronze Age sites through pedestrian surveys and assess their chronological affiliation through test excavations and an extensive radiocarbon dating program. As part of the survey, the BATS Project team of archaeologists identified an archaeological site in the modern village of Stremț. This site – Stremț – *Fabrica de Alcool* – was initially

[1] Beck *et alii* 2020; Boroffka 2006; Ciugudean 2012.
[2] Quinn 2024.

identified through pedestrian survey in 2012 and excavated in 2013. Named after an abandoned alcohol factory building on the outskirts of the village, Stremț – *Fabrica de Alcool* has evidence of occupation in several prehistoric and subsequent phases. In this paper, we present details on the small-scale archaeological investigations and radiocarbon dating at the site of Stremț – *Fabrica de Alcool*. While these investigations are not full assessments of the entire site and site history, they are an important contribution to our understanding of past human activity, especially for the Middle Bronze Age (Wietenberg culture)[3], in the Geoagiu Valley (Valea Mănăstirii).

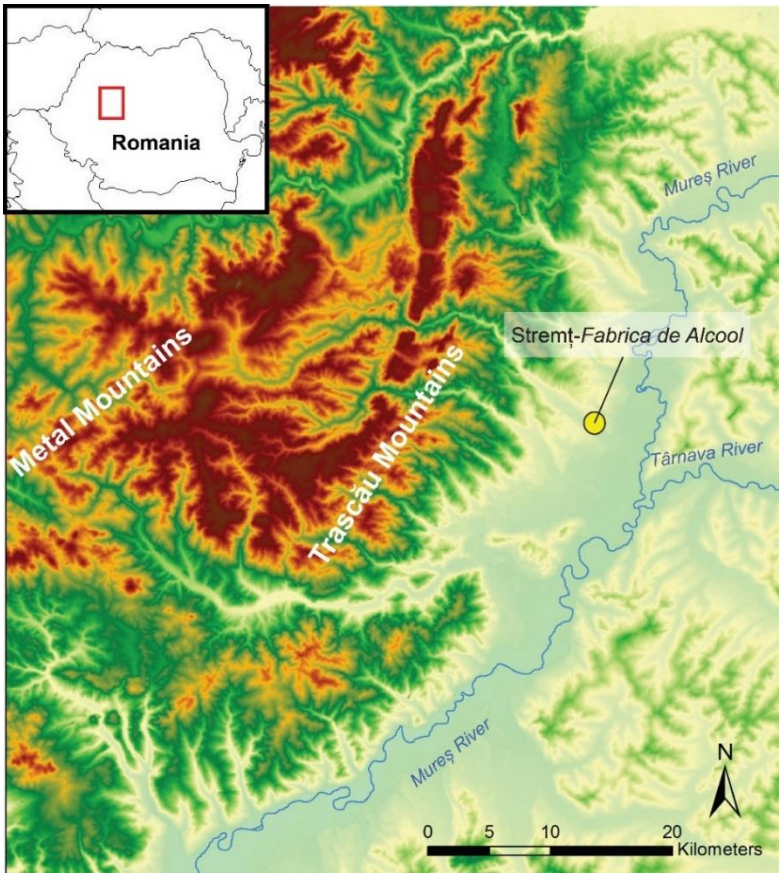

Fig. 1. Map of the location of Stremț – *Fabrica de Alcool* in southwest Transylvania (Alba county).

[3] Andrițoiu 1992; Boroffka 1994; Chidioșan 1980; Horedt 1960.

Site Setting

Stremț – *Fabrica de Alcool* is located on the north side of the Geoagiu River (**Fig. 1**). The site is positioned in the lower portion of the Geoagiu Valley, near the entrance to the village when driving northwest from Teiuș. The site is tucked up just over 2 km into the Geoagiu Valley from the Mureș River Valley, and is just under 5 km from the river itself. Unlike most other Bronze Age sites in southwest Transylvania, the site is not located on a distinct terrace above the Geoagiu Valley. Instead, the site is located on the gradual slope up from the Geoagiu Valley flood plain up to the first terrace. The cultural deposits increase in depth (with more distinct occupation levels from different chronological phases preserved) from the southwestern to the northeastern site boundary, which suggests that the slope of the modern ground surface is due in part to cultural deposits and the original site surface was likely flatter. The large abandoned alcohol factory building built on the east end of the site has likely disturbed the eastern site boundary (**Fig. 2**). The site extends across multiple field systems, a road, and a row of modern houses. The site extent likely varied by time period, though the limited subsurface testing did not allow a phase-by-phase site extent to be determined.



Fig. 2. Photograph of Stremț – *Fabrica de Alcool*, from the northeast corner of the site facing southwest. Note the factory building at the left side of the photo. (Photo by C. Quinn).

Survey and Test Excavations

In this section we describe the field methodologies and brief descriptions of the results of fieldwork at Stremț – *Fabrica de Alcool*. We pay particular attention to the depositional history of the site as determined through test excavations. These multiscalar methods provide an opportunity to gain an initial insight into the nature of occupation at Stremț – *Fabrica de Alcool*, though these results are preliminary.

Pedestrian Survey

The site was discovered while conducting pedestrian survey in plowed agricultural fields. Once the site was identified, the BATS Project team conducted pedestrian survey transects with 5 m spacing intervals across the accessible areas of the site. This intensive pedestrian survey was used to estimate the horizontal extent of the site. We estimate the site's size, based on the extent of artifacts on the surface, to be approximately 3.73 hectares (**Fig. 3**).



Fig. 3. Map of Stremț – *Fabrica de Alcool*.

Shovel Test Probes

We placed seven shovel test probes (STPs) towards the center of the site, in the agricultural field immediately west of the abandoned alcohol factory building, in order to assess the nature of the deposits below the surface. The location of each STP was recorded using a handheld GPS (Garmin 62s).

Each STP was approximately 30 cm wide, except for STP 7, which was 50 cm wide. The depth and width of each STP varied depending on the nature of the deposits and whether promising cultural material was identified. STP 1 was 73 cm deep and showed evidence of significant bioturbation (rodent activity). STP 2 was 33 cm deep, extending just 3 cm into intact cultural material below the 30 cm thick plow zone. STP 3 was 35 cm deep, with a plow zone full of modern trash, and a lower layer with stones and a few wheel made ceramics that were laying flat along a texture change in the soil – likely marking intact deposits beneath. STP 4 was also excavated to a depth of 35 cm, 30 cm of which was plow zone. STP 5 was excavated to a depth of 28 cm – the end of the plow zone – uncovering highly bioturbated deposits. STP 6 was excavated to approximately 35 cm in depth below surface, confirming the presence of intact deposits below the plow zone. STP 7, the largest at 50 x 50 cm in width and 96 cm in depth, revealed at least two different levels of cultural material (including Bronze Age ceramics *in situ*) below the plow zone.

These STPs helped identify where there were promising intact cultural deposits. The STPs were used to inform where to place excavation units. Specifically, STP 4 was expanded and excavated as Unit 1, STP 6 was expanded and excavated as Unit 2, and STP 7 was expanded and excavated as Unit 3.

Test Excavation Units

We excavated three 1 x 1 m excavation units in site locations that the STPs indicated would have the best chance of producing intact cultural deposits from the Bronze Age. Each test unit was excavated in 10 cm arbitrary levels within natural stratigraphy until sterile sediment was reached. All material culture was collected within each level, and radiocarbon samples of charcoal were taken when encountered. Artifacts were processed and are stored at the National Museum of the Union Alba Iulia.

Unit 1: Unit 1 is positioned close to the southern edge of the site in the lowest position of the test excavation units. Excavations in Unit 1 contained four depositional layers but no intact evidence of Bronze Age activity (**Fig. 4**). Level 1 was 30 cm of sediment disturbed by modern plowing (plowzone). Below the plowzone, Level 2 was a mottled layer of compact sediment with both yellow clay and darker brown sediment and a mix of material culture from different periods (**Fig. 7a**). This layer did not have evidence of modern contamination, but there is evidence of bioturbation moving clays through the profile. This layer is above

Level 3, which is marked by an intact linear arrangement of stones running roughly east-west through the northern edge of the unit. This appears to be a portion of a rock wall. Level 3 had some evidence of architectural debris and material culture from the Early Migration Period. This occupation appears to lie directly on sterile subsoil, a compact level of yellow clay (Level 4).

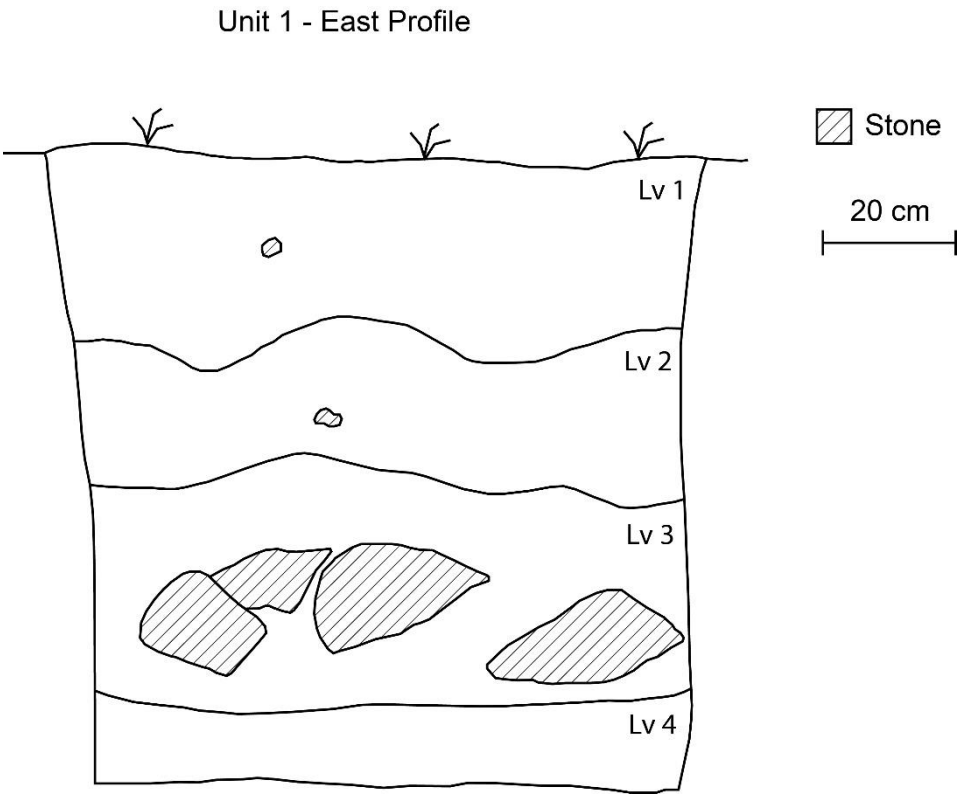

Fig. 4. East profile of Unit 1, Stremț – *Fabrica de Alcool*.

Unit 2: Unit 2 is located a little farther upslope but relatively close to Unit 1 and the southern edge of the site. Unit 2 revealed four distinct depositional layers. Level 1 was the plowzone (**Fig. 5**). This 25 cm deep level had a mix of archaeological materials from several temporal phases represented at the site. Level 2 was an intact cultural level interpreted as a Early Migration Period occupation (4th-5th century CE). This level contained architectural debris, charcoal, and wheel-made ceramics. Level 3 was primarily a pit associated with Wietenberg Type A ceramics, although two small sherds with very typical Wietenberg Type C ceramic decoration were found within the pit (**Fig. 7b-f**).

Level 3 was highly bioturbated – there was evidence of yellow sterile clay brought up into this level by animals. It is likely that the Wietenberg Type C ceramics originated in a higher, post-Level 3 layer that was destroyed by the Migration Period occupation. Other Wietenberg Type C ceramics were found in the area around Unit 2 on the surface. Level 4 was a yellow clay layer that did not have any evidence of cultural disturbances. This final level is sterile subsoil and the excavations ended once this layer was clearly defined.

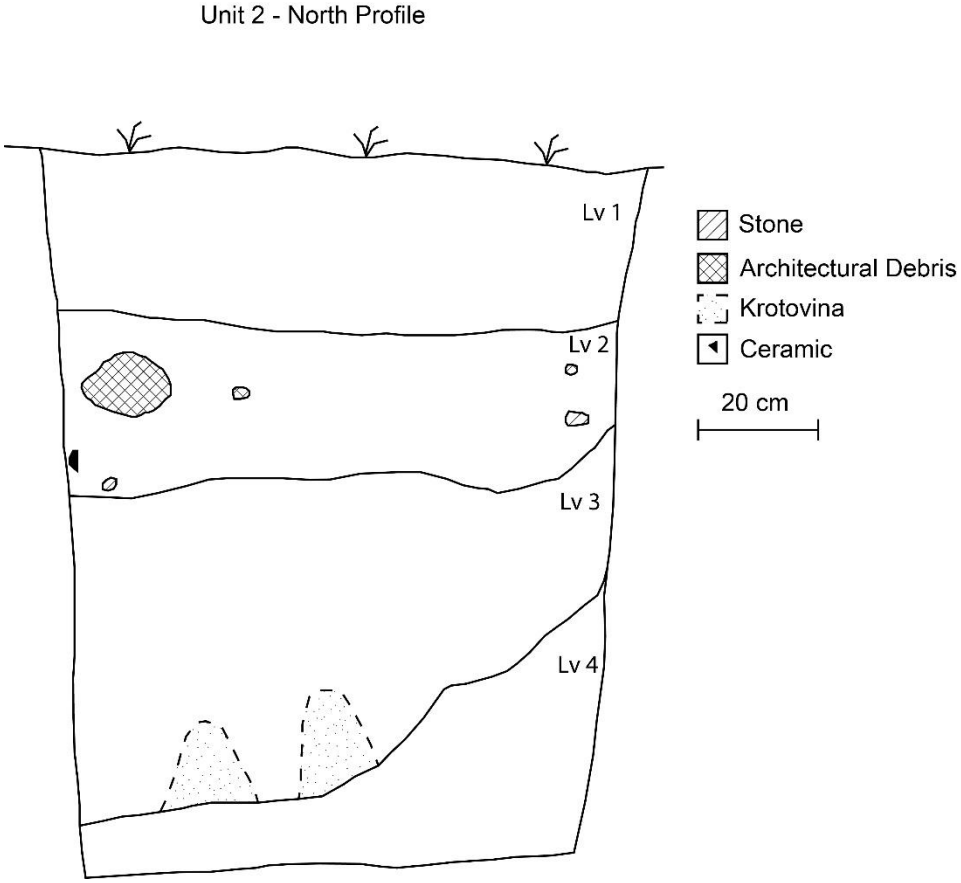

Fig. 5. North profile of Unit 2, Stremț – *Fabrica de Alcool.*

Unit 3: Unit 3 is located on the northern margin of the site extent as determined by the pedestrian survey. This unit is farther uphill and away from the Geoagiu Valley flood plain. Excavations in this unit revealed the most intact cultural deposits of all of the test excavations – approximately 1.8 m from the

surface to the base of the archaeological deposits (**Fig. 6**). There is evidence of bioturbation in the form of root activity and worm activity throughout the soil column, but it appears to have had less of an impact on the archaeological deposits than the bioturbation in Unit 2. Unit 3 contained nine levels of stratigraphy, including plowzone (Level 1) and sterile subsoil (Level 8). The levels were labeled during excavation in the order in which they were identified. Level 2 was the Migration Period occupation, approximately 33 cm in depth. Level 3, approximately 34 cm in depth, was a layer of intact Late Bronze Age occupation. There was no culturally diagnostic material in this level, but surface survey at the site previously found Noua ceramics. There is not enough information yet to assign this layer to a particular cultural group. Level 3 was made of darker and more organic rich sediment than Level 2. Level 4 contained Wietenberg Type C ceramics amongst the 19 cm of cultural deposits (**Fig. 7g-j**). This level has more charcoal than Level 3 but significantly less than Level 5, and more large stones and fewer pebbles than the level above it. Level 5 also contained Wietenberg Type C ceramics and is approximately 18 cm deep. The most important aspect of Level 5 is the presence of a corner of a burnt clay thermal feature – potentially an oven or kiln – that extended into the unit from the eastern profile. The feature is approximately 30 cm across as it goes into the eastern profile. The bottom of the feature was flat, and nearby ceramics were lying horizontally, which suggests that the feature was placed on some sort of living surface. Beyond the feature, the matrix of this level was a grey-brown sediment with a vast quantity of large charcoal pieces. Level 6 was an occupation fill layer below the thermal feature and it is approximately 13 cm deep. This level was a brown-grey sediment with a mix of cobbles and pebbles nearby. There was significantly less charcoal. The ceramics are consistent with Wietenberg Type A ceramics, and may be associated with the same occupation as the pit excavated in Unit 2. Level 7 was an occupational fill layer, approximately 19 cm deep, of compact dark grey sediment with few artifacts. The ceramics are chaff-tempered, which is consistent with Early Neolithic Criș culture in this region. A small portion of a pit was identified at the base of this level. The pit was located in the northeast corner of the unit and continued into the north and east profiles. The pit fill was excavated as Level 9, as it was identified after the sterile layer (Level 8) was found. The pit was approximately 16 cm deep and consisted of a loose dark grey-brown sediment excavated into sterile subsoil. The sterile subsoil in this Unit was called Level 8, and was a compact light grey-brown clay with a blocky structure. The sterile in Unit 3 differed from the sterile in Units 1 and 2 in its color, but they did share a consistent lack of artifacts or charcoal, a blocky structure, and were highly compacted.

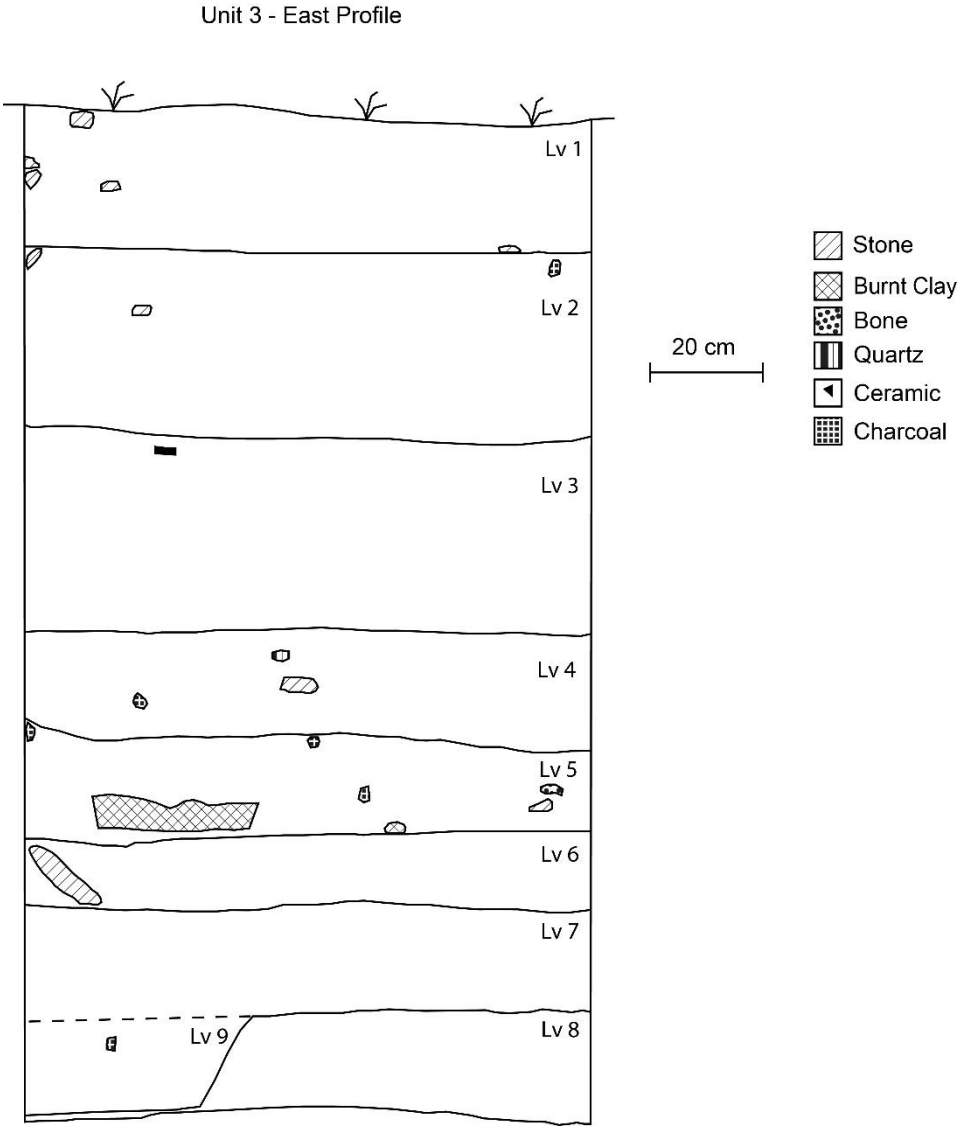

Fig. 6. East profile of Unit 3, Stremț – *Fabrica de Alcool.*



Fig. 7. Artifacts from Unit 1 (a), Unit 2, (b-f), and Unit 3 (g-j) at Stremț – *Fabrica de Alcool*.

Chronology

A total of six radiocarbon samples were run from Stremț - *Fabrica de Alcool*. All samples were wood charcoal and were processed at the National Ocean Sciences Accelerator Mass Spectrometry Facility (NOSAMS) at Woods Hole Oceanographic Institution. We used OxCal v.4.4.4 with the IntCal20 calibration to construct Bayesian models of the site history[4] (**Table 1**). Samples came from two distinct locations at the site (Unit 2 and Unit 3). Unit 2 contained four levels of stratigraphy, including the plowzone (Level 1) and the sterile subsoil (Level 4). No samples were run from these levels, or from Level 2, a Migration Period occupation. A sample from Level 3 was selected for radiocarbon dating because of the presence of Wietenberg Type A and Wietenberg Type C ceramics (**Fig. 8**). A wood charcoal sample from Level 3 produced a date of 1520 ±25 BP (OS-107551). It is clear that this sample is intrusive into Level 3 from the Migration Period occupation (Level 2). There was significant bioturbation in this Unit, as seen in the rodent activity in the sediment, as well as the movement of artifacts through the profile (the two small Wietenberg Type C ceramics amongst Formative Wietenberg deposits). As a result, we were unable to directly date the Bronze Age level in Unit 2. Perhaps fortunately, sample OS-107551 does provide a direct date of the Migration Period occupation at the site.

Table 1. Radiocarbon dates from Stremț – *Fabrica de Alcool*.

Sample Number	**Context**	**Cultural Affiliation**	**Sample Material**	**Uncalibrated Date**	**Calibrated Date (2-sigma; 95%)**
OS-107551	Unit 2 – Level 3	Migration Period*[1]	Charcoal	1520 ±25 BP	435-605 cal. CE
OS-107622	Unit 3 – Level 6	Wietenberg	Charcoal	3560 ±35 BP	2025-1770 cal. BCE
OS-107621	Unit 3 – Level 5	Wietenberg	Charcoal	3520 ±30 BP	1935-1745 cal. BCE
OS-107620	Unit 3 – Level 5	Wietenberg	Charcoal	3480 ±30 BP	1890-1695 cal. BCE
OS-107553	Unit 3 – Level 4	Wietenberg	Charcoal	3560 ±25 BP	2015-1775 cal. BCE
OS-107552	Unit 3 – Level 3	Late Bronze Age*[2]	Charcoal	34700 ±190	38450-37465 cal. BCE

*[1] - moved through bioturbation into Wietenberg Type C level.
*[2] – contaminated date.

[4] Bronk-Ramsey 2009; Reimer *et alii* 2020.

Unit 3 produced important dates for Middle Bronze Age settlement at Stremț – *Fabrica de Alcool*. Level 6 contained Wietenberg Type A ceramics, likely the same occupation as the layer and pit in Unit 2, and produced a date of 3560 ±35 BP (OS-107622). Levels 5 and 4 were associated with Wietenberg Type C ceramics. Two samples were taken from Level 5; one from within the burnt feature that produced a date of 3520 ±30 BP (OS-107621), and one that postdated the collapse of the burnt feature 3480 ±30 BP (OS-107620). Level 4 produced a date of 3560 ±25 BP (OS-107553). Level 3 was associated with non-culturally diagnostic Late Bronze Age ceramics. A charcoal sample from Level 3 was run and produced a date of 34700 ±190 BP (OS-107552), which is obviously contaminated. Level 3 remains undated using radiocarbon methods, though it may be associated with the Wietenberg or Noua ceramics found in the plowzone at the site.

The dates from Unit 3 can be modeled to provide a site occupation history (**Table 2**). We chose to model the dates in two different ways, in large part due to the amount of bioturbation observed at the site. Model 1 is a stratigraphic sequence model that assumes that dates are in sequential order (**Fig. 8**). Model 1 has good agreement with the samples and is feasible (A_{model}=65.6; $A_{overall}$=71.2). Model 2, on the assumption that charcoal sampled may have moved vertically through the soil column, lumps all dates together (**Fig. 9**). Model 2 has good agreement with the samples and is also feasible (A_{model}=99.2; $A_{overall}$=99.2).

Table 2. Bayesian models of Wietenberg radiocarbon dates from Stremț – *Fabrica de Alcool*.

Sample	**Model 1***	**Model 2***
Level 6 (OS-107622)	1940-1820 cal. BCE	1930-1780 cal. BCE
Level 5 Thermal Feature (OS-107621)	1910-1820 cal. BCE	1900-1780 cal. BCE
Level 5 Post-Thermal Feature (OS-107620)	1890-1800 cal. BCE	1890-1800 cal. BCE
Level 4 (OS-107553)	1850-1770 cal. BCE	1930-1820 cal. BCE

*-Modelled dates based on 1-sigma (68%)

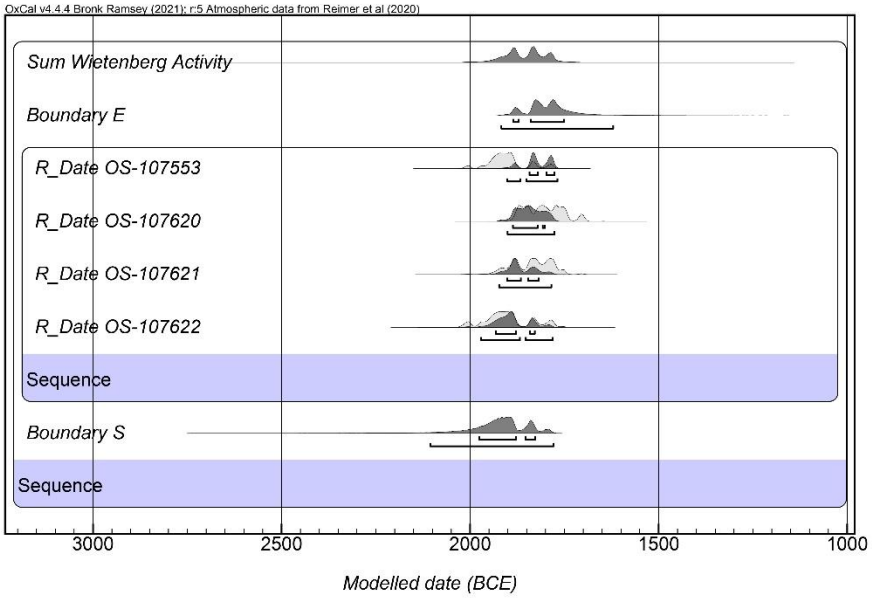

Fig. 8. Bayesian model of Wietenberg activity Stremț – *Fabrica de Alcool* using stratigraphic relationships among samples (Model 1).

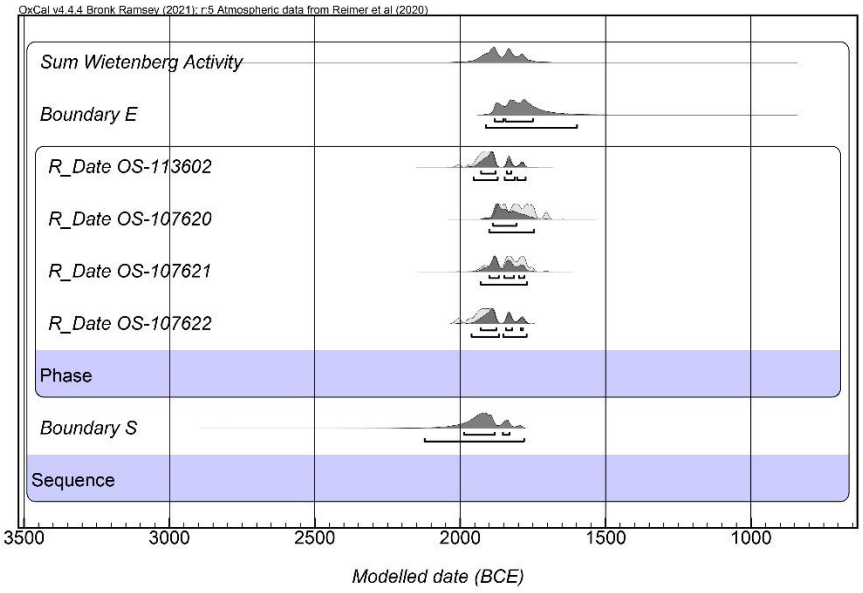

Fig. 9. Bayesian model of Wietenberg activity at Stremț – *Fabrica de Alcool* as a single phase (Model 2).

It is important to note that the model that assumes stratigraphic relationships among the samples are intact (Model 1) is feasible. Samples from Unit 3 come from much more secure contexts than those in Unit 2 where significant amounts of bioturbation were easily identifiable. In Unit 3, the date from Level 6 is directly below the intact thermal feature in Level 5, and is likely securely capped by the thermal feature. The two dates associated with the thermal feature also are securely later than the sample from Level 6 and in sequence (within the feature and in the capping rubble). The sample from Level 4, which is less securely separated from Level 5 (than the contact between Levels 5 and 6), is earlier than expected, but not so much as to be impossible. While Model 2 has high agreement, it explains only the duration of occupation, not the internal development of the Bronze Age settlement. Both models suggest the Wietenberg occupation was probably less than 180 years (68%) (**Fig. 10**). The three levels of activity occurred between approximately 1940 and 1800 cal. BCE. While more samples are needed, particularly to date the Late Bronze Age occupation at the site, the internal sequence seen in the material culture is supported through the chronological models.

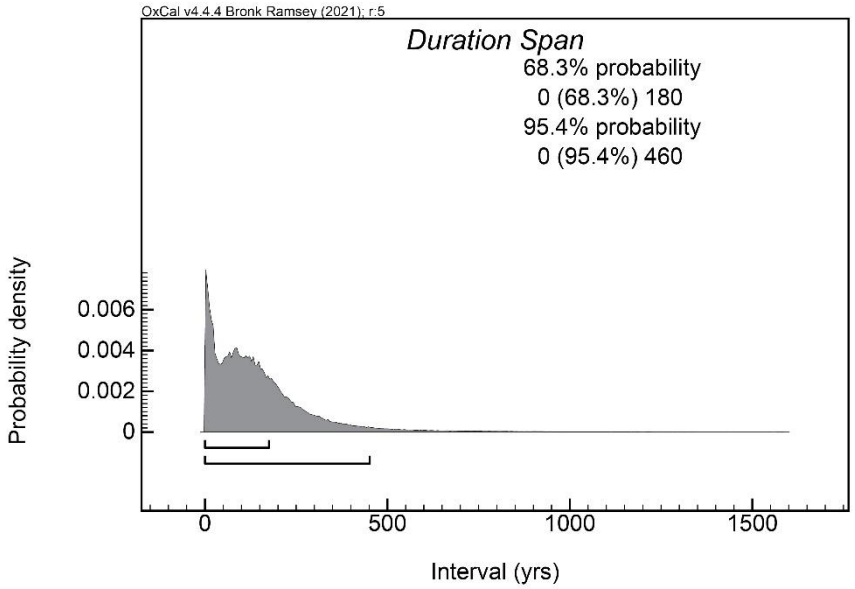

Fig. 10. Duration of activity at Stremț – *Fabrica de Alcool*, based on Model 1.

Discussion

The survey and test excavations at Stremț – *Fabrica de Alcool* make an important contribution to our understanding of (1) the site's history, (2) the site's position within the Geoagiu Valley, and (3) the broader effort to understand Wietenberg chronology through radiocarbon dating.

The surface survey identified a spread of material culture, including Bronze Age ceramics, that extends over 3.73 hectares along the south-facing slope above the Geoagiu Valley. This site size estimate is based on surface collections. However, the excavations revealed that the situation at Stremț – *Fabrica de Alcool* – and likely other sites in the Apuseni Mountains – was more complicated. Unit 3 was positioned on the northern edge of the distribution of artifacts on the surface. Interestingly, this excavation unit revealed the deepest, most intact, and most stratigraphically complete deposits at the site. We believe this suggests that there is a great potential that the site itself extends even farther north – up the slope – than we can confirm through pedestrian survey. Pedestrian survey relies on the presence of visible artifacts in the plowzone. At Stremț – *Fabrica de Alcool*, the farther upslope we went, the fewer artifacts there were in the plowzone, but the more intact deposits were present below the surface. This suggests that slope erosion over millennia may have helped cap the archaeological deposits and preserved more of the site farther to the north. At the other end of the site, erosion and mechanized plowing have likely destroyed much of the intact Bronze Age occupation layers, though finding pits (like in Unit 2) may still be possible. The work at Stremț – *Fabrica de Alcool* suggests that pedestrian survey alone cannot confirm the size and stratigraphic complexity of Bronze Age sites in the region. This has implications for managing cultural resources in the Apuseni Mountains, as locations where there may be no visible artifacts on the surface may still have important cultural deposits buried below the plowzone. For Stremț – *Fabrica de Alcool*, additional work, particularly on the northern margin of the site, will be needed to help refine our understanding of the size of the site.

The southern exposure of the site follows a pattern seen at other prehistoric sites in southwestern Transylvania where these communities prioritized site settings where there would have been the greatest availability of sun exposure, particularly during the cold winters. Keeping warm would have been an important challenge for Bronze Age communities, and by placing their settlement with a southern exposure, the people at Stremț – *Fabrica de Alcool* situated their community in a place to help with that challenge.

Stremț – *Fabrica de Alcool* is a medium-sized site within the Geoagiu Valley during the Middle Bronze Age. Peștelca – *Cascadă*, located across the Mureș River from the Geoagiu Valley, is the largest site in the area at

approximately 8.81 hectares[5]. Geoagiu de Sus – *Fântâna Mare*, positioned farther upriver, is 3.53 hectares, which is similar in size to Stremț – *Fabrica de Alcool*. There are also smaller sites in the Geoagiu Valley, such as Geoagiu de Sus – *Viile Satului* – a 0.95 hectare site approximately 5 km up the Geoagiu River[6]. As a medium-sized site located up the Geoagiu Valley, Stremț – *Fabrica de Alcool* can provide important information about what life was like in Wietenberg villages away from the major towns (like Pețelca – *Cascadă*) and the important interregional trade corridor (Mureș River Valley). Future analyses of material culture, and additional archaeological excavations, would be helpful in assessing the socioeconomic organization of this site – and how it changed during the Bronze Age.

The radiocarbon dates from Stremț – *Fabrica de Alcool* contribute to a growing corpus of radiocarbon dates for the Wietenberg culture[7]. The earliest Middle Bronze Age occupation (Wietenberg A) at Stremț – *Fabrica de Alcool* is within the Formative Wietenberg phase[8]. The dates from the later phase of occupation, from the level with the thermal feature and associated with Type C ceramics, are amongst the earliest dates associated with this style of material. As a result, this is a site with two layers of Middle Bronze Age activity that both occurred within a relatively short and continuous period of time. After 1800 cal. BCE, the site was likely abandoned before it was reoccupied in the Late Bronze Age. The timing of that reoccupation remains unknown and will require running additional samples.

Overall, the site appears to bridge the Formative / Classical Phase boundary (approximately 1875 cal. BCE[9]). There are other settlements in Transylvania that have dates that suggest they were generally contemporaneous with Stremț – *Fabrica de Alcool*. These include Geoagiu de Sus – *Fântâna Mare*[10], Rotbav – *La Pârâuț*[11], Pețelca – *Cascadă*[12], Oarța de Sus – *Ghiile Botii*[13], and Alba Iulia – *Recea/Monolit*[14].

[5] Quinn, Ciugudean 2025.
[6] Ciugudean 1999; Ciugudean, Quinn 2015.
[7] Bălan, Quinn 2014; Bălan *et alii* 2016; Bălan *et alii* 2017; Bălan *et alii* 2018; Berecki 2016; Ciugudean, Quinn 2015; Ciuta *et alii* 2021; Dietrich 2014; Gogâltan 2015; Kacsó 2004; Németh 2015; Popa, Boroffka 1996; Quinn, Ciugudean 2025; Quinn *et alii* 2020; Rotea *et alii* 2014; Whitlow *et alii* 2013.
[8] see Quinn *et alii* 2020.
[9] see Quinn *et alii* 2020.
[10] Quinn *et alii* 2020.
[11] Dietrich 2014.
[12] Quinn, Ciugudean 2025.
[13] Kacsó 2004.
[14] Quinn *et alii* 2020.

The site is also roughly contemporary with the cemeteries at Sebeș – *Între Răstoace*[15] and Limba-Oarda de Jos – *Șesul Orzii*[16], likely starting before these cemeteries and being abandoned before they fell out of use. No Wietenberg cemetery has been found in this region of the Geoagiu Valley, so it is unclear where the community from Stremț – *Fabrica de Alcool* buried their dead.

In addition to the contribution to our understanding of the Wietenberg culture, these archaeological investigations have revealed additional occupations at Stremț – *Fabrica de Alcool*, including from the Neolithic, Late Bronze Age, and Migration Period. The Migration Period occupation was directly dated in this study, to between approximately 545 and 590 cal. CE (68%) or 435 and 605 cal. CE (95%). There is potential for additional work at the site to further refine the chronology of the Neolithic occupation, from which samples were not run in this study.

Conclusion

In this study, we have presented an overview of archaeological investigations at Stremț – *Fabrica de Alcool*. While taphonomic processes have damaged several areas of the site, including modern construction and farming activity, we have confirmed that there is good preservation of at least some of the site. We have identified activity from the Neolithic, Middle Bronze Age, Late Bronze Age, and Migration Period. We have also presented new Bayesian models and contextual information for radiocarbon dates at the site. In particular, four dates associated with the Wietenberg culture (1940-1800 cal. BCE) have shown the importance of this site during the Formative and Classical Wietenberg phases of the Middle Bronze Age. Based on test excavations, which have revealed 1.8 m of intact archaeological deposits, this new site offers significant potential for future research.

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[15] Bălan *et alii* 2017; Bălan *et alii* 2018.
[16] Ciută *et alii* 2021; Quinn, Ciută 2025.

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ABSTRACT

In 2011, a team of American and Romanian archaeologists initiated a research project designed to document the lifeways of Bronze Age communities in southwest Transylvania, in the area administratively delimited by the borders of Alba County. The project is called the Bronze Age Transylvania Survey (BATS) Project. During the field research, the BATS archaeological team identified a site on the southeast margin of the the modern village of Stremț. This site – Stremț – *Fabrica de Alcool* – was initially identified on survey in 2012 and subsequently investigated through additional surveys and test excavations in 2013.

This study presents Bayesian models and contextual information on radiocarbon dates taken from the archaeological site. Four dates associated with the Wietenberg culture (1940-1800 cal. BCE) indicate in particular the importance of this site for the Formative and Classical phases of the Wietenberg culture of the Transylvanian Middle Bronze Age.

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Bibliography:

Andrițoiu 1992 – I. Andrițoiu, *Civilizația tracilor din sud-vestul Transilvaniei în epoca bronzului*. Bibliotheca Thracologica Institutul Român de Tracologie, Bucharest, 1992.

Bălan, Quinn 2017 – G. Bălan, C. Quinn, „Radiocarbon Dates of the Middle Bronze Age Settlement at Micești-*Cigaș* (Alba County, Romania)", *Annales Universitatis Apulensis. Series Historica*, 18 (II), 2017, p. 119-126.

Bălan *et alii* 2016 – G. Bălan, C. Quinn, G. Hodgins, „The Wietenberg Culture: Periodization and Chronology", *Dacia N.S.*, 60, 2016, p. 67-92.

Bălan *et alii* 2017 – G. Bălan, C. Quinn, G. Hodgins. „Contextul cultural și cronologic al necropolei de la Sebeș – Între răstoace", in: C. Fântâneanu, G. Bălan, S. Popa, D. Tentiș, *Necropola din epoca bronzului de la Sebeș*, Brăila, Editura Istros a Muzeului Brăilei "Carol I", 2017, p. 167-190.

Bălan *et alii* 2018 – G. Bălan, C. Quinn, G. Hodgins. „The Cultural and Chronological Context of the Bronze Age Cemetery from Sebeș-Între Răstoace", in: R. Németh, B. Rezi, S. Berecki, *Bronze Age Connectivity in the Carpathian Basin*, Târgu Mureș, Bibliotheca Mvsei Marisiensis, 2018, p. 183-216.

Beck *et alii* 2020 – J. Beck, H. Ciugudean, C. Quinn, „Bioarchaeology and Mountain Landscapes in Transylvania's Golden Quadrangle", *Bioarchaeology International*, 4 (2), 2020, p. 89-110.

Berecki 2016 – S. Berecki, *The Bronze Age Site at Luduș*, Târgu Mureș, 2016.

Boroffka 2006 – N. Boroffka, „Resursele minerale din România și stadiul actual al cercetărilor privind mineritul preistoric", *Apulum*, 43 (1), 2006, p. 71-94.

Boroffka 1994 – N. Boroffka, *Die Wietenberg-Kultur, Ein Beitrag zur Erforschung der Bronzezeit in Südosteuropa.* Universitätsforschungen zur Prähistorischen Archäologie 19, Dr. Rudolf Habelt GmbH, Bonn, 1994.

Bronk Ramsey 2009 – C. Bronk Ramsey, „Bayesian analysis of radiocarbon dates", *Radiocarbon*, 51, 2009, p. 337-360.

Chidioșan 1980 – N. Chidioșan, *Contribuții la istoria tracilor din nord-vestul României. Așezarea Wietenberg de la Derșida*, Contibutions à l'histoire des Thraces du Nord-Ouest de la Roumanie. L'établissement de la culture Wietenberg de Derșida, Oradea, 1980.

Ciugudean 1999 – H. Ciugudean, „Betrachtungen zum Ende der Wietenberg-Kultur", in: N. Boroffka, T. Soroceanu, *Transsilvanica. Archaologische Untersuchungen zur Alteren Geschichte des Sudostlichen Mitteleuropa*, Westfalen, Rahden, 1999, p. 107-131.

Ciugudean 2012 – H. Ciugudean, „Ancient Gold Mining in Transylvania: The Roșia Montana - Bucium Area", *Caiete ARA*, 3, 2012, p. 219-232.

Ciugudean, Quinn 2015 – H. Ciugudean, C. Quinn, „The End of the Wietenberg Culture in the Light of New 14C Dates and Its Chronological Relation Towards the Noua Culture", in: R. Németh, B. Rezi, S. Berecki, *Bronze Age Chronology in the Carpathian Basin*, Târgu Mureș, 2015, p. 147-178.

Ciută *et alii* 2021 – M.-M. Ciută, C. Quinn, R. Totoianu, „Radiocarbon Data of Funerary Discoveries from the Middle Bronze Age in the Mureș Valley: The Wietenberg

Cemetery from Limba-Oarda de Jos (Alba County, Romania)", *Journal of Ancient History and Archaeology*, 8 (2), 2021, p. 75-83.

Dietrich 2014 – L. Dietrich, *Die mittlere und späte Bronzezeit und die ältere Eisenzeit in Südostsiebenbürgen aufgrund der Siedlung von Rotbav*. Universitätsforschungen zur Prähistorischen Archäologie 248, Dr. Rudolf Habelt GmbH, Bonn, 2014.

Gogâltan 2015 – F. Gogâltan, „The Early and Middle Bronze Age chronology on the eastern frontier of the Carpathian Basin: revisited after 15 years", in: R. Németh, B. Rezi, *Bronze Age Chronology in the Carpathian Basin*, Mega, Târgu Mureș, 2015, p. 53-96.

Horedt 1960 – K. Horedt, „Die Wietenbergkultur", *Dacia*, 4, 1960, p. 107-137.

Kacsó 2004 – C. Kacsó, *Mărturii Arheologice*, Baia Mare, 2004.

Németh 2015 – R. Németh, „The Middle Bronze Age "Mass Grave" from Voivodeni–La Școală", in: R. Németh, B. Rezi, *Bronze Age Chronology in the Carpathian Basin*, Târgu Mureș, 2015, p. 179-200.

Popa, Boroffka 1996 – C. Popa, N. Boroffka, „Considerații privind cultura Noua: Așezarea de la Țichindeal, jud. Sibiu", *Studii și Cercetări de Istorie Veche și Arheologie*, 47, 1996, p. 51-61.

Quinn 2024 – C. Quinn, „Inequality in life and death: Bridging divides between domestic and funerary archaeology in Middle Bronze Age Transylvania", *World Archaeology*, 56(5), 2024, p. 565-585.

Quinn, Ciugudean 2025 – C. Quinn, H. Ciugudean, „New Bronze Age Wagon Models from the Wietenberg Culture", *Apulum*, 62/1, 2025, p. 45-61.

Quinn, Ciută 2025 – C. Quinn, M.-M. Ciută, „Chronological modeling demonstrates short use of a Middle Bronze Age cemetery in Transylvania", *Radiocarbon*, 67 (5), 2025, p. 1034-1044.

Quinn *et alii* 2020 – C. Quinn, H. Ciugudean, G. Bălan, G. Hodgins, „Rethinking time, culture, and socioeconomic organisation in Bronze Age Transylvania", *Antiquity*, 94, 2020, p. 44-61.

Reimer *et alii* 2020 – P. Reimer, W. Austin, E. Bard, A. Bayliss, P. Blackwell, C. Bronk Ramsey, M. Butzin, H. Cheng, R. Edwards, M. Friedrich, P. Grootes, T. Guilderson, I. Hajdas, T. Heaton, A. Hogg, K. Hughen, B. Kromer, S. Manning, R. Muscheler, J. Palmer, C. Pearson C, van der Plicht J, Reimer R, Richards D, Scott E, Southon J, Turney C, Wacker L, Adolphi F, Büntgen U, Capano M, Fahrni S, Fogtmann-Schulz A, Friedrich R, Köhler P, Kudsk S, Miyake F, Olsen J, Reinig F, Sakamoto M, Sookdeo A and Talamo S „The IntCal20 Northern Hemisphere radiocarbon age calibration curve (0–55 cal kBP)", *Radiocarbon*, 62 (4), 2020, p. 725-757.

Rotea *et alii* 2014 – M. Rotea, M. Netea, C. De-La-Rua, T. Tecar, M. Hervella, S. Alonso, Z. Maxim, M. Răchită, „The archaeological contexts of DNA samples collected from prehistoric sites in Transylvania", *Acta Mvsei Napocensis*, 51 (I), 2014, p. 21-60.

Whitlow *et alii* 2013 – R. Whitlow, V. Kavruk, D.-L. Buzea, B. Briewig, „Radiocarbon Data from the Cucuteni-Ariușd Levels at Păuleni-Ciuc (Ciomortan) "Dâmbul Cetății", Harghita County", *Acta Terrae Septemcastrensis*, 12, 2013, p. 37-64.