

Tätigkeitsbericht 2023





Neuffenstraße 57 · D-73734 Esslingen am Neckar

An das Regierungspräsidium Stuttgart z.H. Herrn Marek Owens Ruppmannstraße 21

70565 Stuttgart

13. Juni 2024

Tätigkeitsbericht der Foundation for the Study and Preservation of Tells in the Prehistoric Old World für das Jahr 2023

In Einklang mit den Vorgaben der Satzung erfolgte am Dienstag, den 10. Januar 2023, eine gemeinsame Sitzung von Beirat und Vorstand mit Aussprache über die im Vorfeld zirkulierten Förderanträge für 2023, gefolgt von einer Empfehlung in Bezug auf die Förderwürdigkeit der einzelnen Projekte unter Berücksichtigung von deren fachlicher Qualität und ihrer Passung mit dem Stiftungszweck (s. beigefügtes Protokoll).

Auf der unmittelbar anschließenden Sitzung des Vorstandes (s. Protokoll) wurde zunächst die Frage einer möglichen Satzungsänderung diskutiert, um über die jährlichen Förderrichtlinien hinaus die Frage der grundsätzlichen Antragsberechtigung von Mitgliedern von Vorstand und Beirat auch in der Satzung zu fixieren. Nach Rücksprache mit dem Regierungspräsidium durch Kienlin im Nachgang der Sitzung wird von einer entsprechenden Satzungsänderung als sachlich nicht geboten und nicht erforderlich Abstand genommen.

Nach dem anschließenden Bericht über die Finanz- und Ertragslage der Stiftung 2022 und der Beschlussfassung über die Höhe der Fördersumme für das Jahr 2023 erfolgte auf der Sitzung des Vorstandes sodann die Beschlussfassung über die im Jahr 2023 zu fördernden Projekte sowie über das Finanzvolumen der jeweiligen Förderung.

Entsprechend der Empfehlungen des wissenschaftlichen Beirates wurde einstimmig beschlossen, sechs der beantragten acht Projekte zu fördern, wobei es sich bei dreien dieser Projekte um Fortsetzungsanträge bereits 2022 geförderter Vorhaben handelte (Anträge Attila Gyucha et al.,

Goce Naumov et al. und Tanja Zerl) und drei weitere Neuanträge Berücksichtigung fanden (Anträge Jana Anvari et al., Pál Raczky und Danny Rosenberg). Es wurde beschlossen, zwei der bewilligten Projekte im vollen Umfang der beantragten Summe zu fördern (Anträge Jana Anvari et al. und Tanja Zerl), während bei den übrigen Kürzungen gegenüber der beantragten Fördersumme vorgenommen wurden (Anträge Attila Gyucha et al., Goce Naumov et al., Pál Raczky und Danny Rosenberg).

In Hinblick auf die Mehrjährigkeit einiger der geförderten Vorhaben betonte der Vorstand abschließend einmal mehr die Notwendigkeit, den Antragsstellern in den Bewilligungsschreiben zu signalisieren, dass keine Garantie betreffs einer weiteren Förderung in den Folgejahren gegeben werden kann.

Entsprechend dieses Vorstandsbeschlusses wurden im Jahr 2023 die folgenden Projekte gefördert:

A multi-method toolkit to study burnt daub (Jana Anvari et al.) mit einer Fördersumme von **6.000** Euro für das Jahr 2023.

Gegenstand dieses neu geförderten Projektes ist die Entwicklung eines Methodenkanons für das systematische Studium prähistorischen Hüttenlehms mittels archäologischer und naturwissenschaftlicher Methoden am Beispiel des Materials von neolithischen und bronzezeitlichen Tellsiedlungen in Südosteuropa. Angestrebt wird damit zugleich der diachrone Vergleich tellspezifischer Architektur- und Baupraktiken. Das Projekt ist innovativ und von potentiell großer methodischer Bedeutung für das zukünftige Studium dieses oftmals vernachlässigten Fundmaterials von prähistorischen Tellsiedlungen.

Time Will Tell: The Vésztő-Mágor Conservation and Exhibition Program (Attila Gyucha et al.) mit einer Fördersumme von **10.000** Euro für das Jahr 2023.

Die 2022 durch die FSPT geförderten Arbeiten in Vésztő-Mágor konnten von Fischl/Kienlin im Rahmen einer Exkursion in Augenschein genommen werden und sind als hoch professionell anzusehen. Nach wie vor gilt, dass dieses Projekt mit seinem Fokus auf der Instandsetzung und musealen Präsentation der Profile der Altgrabung von Vésztő-Mágor (Ungarn) in besonderem Maße dem Anliegen der Stiftung entspricht, einen Beitrag zur Erhaltung prähistorischer, hier neolithischer Tellsiedlungen zu leisten. In Hinblick auf die Mehrjährigkeit des Vorhabens wurde den Antragstellern jedoch signalisiert, dass keine Garantie für eine weitere Förderung in den Folgejahren gegeben werden kann.

Chronology, society and environment of the Neolithic tells in Pelagonia (Goce Naumov et al.) mit einer Fördersumme von **10.000** Euro für das Jahr 2023.

Die laut des vorliegenden Berichtes 2022 erfolgten Arbeiten sind als erfolgreich zu bewerten. Dem Projekt ist nachwievor hohe wissenschaftliche Qualität zu bescheinigen und das Potential, einen entscheidenden Beitrag zur Erforschung einer bislang nicht ausreichend verstandenen prähistorischen Siedlungslandschaft und ihrer Tellsiedlungen zu leisten. Die Erweiterung um einen weiteren Fundort, der akut von der Zerstörung bedroht ist, wird als nachvollziehbar angesehen. Es bestehen jedoch Zweifel am Vorhandensein einer langfristigen Strategie jenseits der möglichst umfassenden Abdeckung der Telllandschaft Pelagonien. Dessen ungeachtet wurde eine erneute Förderung des Projektes als wünschenswert angesehen, insbesondere auch in Hinblick auf den breiten zur Anwendung kommenden Methodenkanon, der noch wesentliche Erkenntnisfortschritte verspricht. Angesichts der Mehrjährigkeit des Vorhabens wurde den Antragstellern jedoch signalisiert, dass keine Garantie für eine weitere Förderung in den Folgejahren gegeben werden kann und eine inhaltliche Fokussierung als wünschenswert angesehen wird.

Geophysical prospection on the prehistoric tell settlement of Berettyóújfalu-Herpály (Pál Raczky) mit einer Fördersumme von **4.500** Euro für das Jahr 2023.

Die Förderung soll es ermöglichen, die im Rahmen einer ausgelaufenen Kooperation begonnene geomagnetische Prospektion des wichtigen Fundortes Berettyóújfalu-Herpály zu einem erfolgreichen Abschluss zu bringen. Hervorzuheben sind hier das langjährige Engagement des Antragsstellers für die Erforschung des Spätneolithikums in Ostungarn, und das Potential seiner Arbeitsgruppe, mit einem entsprechenden Zuschuss die Arbeiten in Berettyóújfalu-Herpály zu einem erfolgreichen Abschluss zu bringen. Perspektivisch ist auch das langfristige Engagement des Antragsstellers hervorzuheben, der sich für den Erhalt der von ihm erforschten Tellsiedlungen einsetzt, so durch den Erwerb und die Unterschutzstellung des Fundortes Polgár-Csöszhalom.

The very end of Tel Tsaf and the WHY question (Danny Rosenberg) mit einer zweckgebundenen Fördersumme für begleitende naturwissenschaftliche Untersuchungen von **5.500** Euro für das Jahr 2023.

Gegenstand dieses erstmals geförderten Projektes sind die späten Phasen und das Ende des wichtigen chalkolithischen Fundortes Tell Tsaf in Israel. Es liegt hiermit eine explizit tellbezogene Fragestellung vor, eben das Abbrechen dieser spezifischen, ortsstabilen Lebensform zugunsten kurzfristiger belegter Ansiedlungen, eine Frage im Spannungsfeld kultureller Faktoren wie des bewussten Traditionsbezuges und öko- bzw. geodeterministischer Betrachtungsweisen. Eine vollumfängliche Förderung gemäß des Antrages hätte die Mittel der FSPT überstiegen. Die Projektidee und Frage nach dem Ende der Lebensweise Tell wurde jedoch als förderwürdig angesehen und entsprechend in beschränktem Umfang mit Mitteln für die Durchführung der grabungsbegleitend geplanten naturwissenschaftlichen Untersuchungen unterstützt.

Archäobotanische Untersuchungen in Borsodivánka-Nagyhalom (Ungarn) (Tanja Zerl) mit einer Fördersumme von **6.000** Euro für das Jahr 2023.

Es handelt sich um die Fortsetzung der bereits im Jahr 2022 geförderten Auswertung der botanischen Großreste aus der Tellgrabung von Borsodivánka-Nagyhalom in Nordostungarn. Neben den guten Erhaltungsbedingungen und dem umfangreichen Datenbestand besteht besonderes wissenschaftliches Potential in dem dadurch ermöglichten Vergleich der Wirtschaftsweise, Subsistenzstrategien und Umweltbedingungen von Borsodivánka mit dem Tell von Toboliu im benachbarten Rumänien, dem sich ein verwandtes Kölner Projekt widmet.

Die damit für 2023 bewilligte Fördersumme von insgesamt 42.000 Euro wurde – mit Ausnahme des Pelagonien-Projektes – vollständig abgerufen und der Stiftung gegenüber durch entsprechende Quittungen etc. belegt. Die zu Förderzwecken verausgabte Summe enthält die Kosten für Auslandsüberweisungen, die von der Stiftung übernommen wurden.

Im April erfolgte durch den Vorsitzenden ein Update der Förderrichtlinie für das kommende Jahr 2024. Diese aktualisierte Förderrichtlinie wurde von dem Vorstand im Umlaufverfahren einstimmig gebilligt und über die über die Homepage der Stiftung veröffentlicht, sowie über academia.edu und die entsprechenden Netzwerke der Beirats- und Vorstandsmitglieder verbreitet. Die Antragsfrist für das Einreichen entsprechender Projektvorschläge endete am 30. November. Bis zum Stichtag wurden insgesamt sieben Anträge eingereicht.

Mit freundlichen Grüßen,

TUil

(Prof. Dr. Tobias L. Kienlin)

Anlagen: Jahresrechnung, Protokolle, geförderte Projekt, Förderrichtline 2024



Jahresrechnung 2023

Teil 1: Einnahmen-/Ausgabenrechnung vom

Finnahmon					
I. Kapitalerträd	ae				
1. Zinsen	·			•	
2. Dividenden					
3. realisierte K	ursgewinne aus Wertpapierverkäufen				
4. realisierte G	ewinne aus Beteiligungen				
II. sonstige Ein	nahmen				
1. Miete/Pacht					
2. Umsatzerlös	se				
III. Zuwendunge	en				
1. Spenden				-	
2. sonstige Zuv	vendungen (z.B.: Zustiftungen)				
Summe Einnahme	en				
Ausgaben					
I. Ausgaben fü	ir den Stiftungszweck				
(s. Bericht ü	ber Erfüllung Stiftungszweck)				
II. Verwaltungs	ausgaben				
1. Vergütung d	es Vorstands			•	
2. Vergütung w	veiterer Organmitglieder				
3. Auslagen fü	r Organmitglieder				
4. sonstige Per	rsonalkosten				
III Vermögensv	verwaltung				
IV. Rechts- und	Beratungskosten				
V. sonstige Auf	wendungen				
1. realisierte K	ursverluste			-	
2. Zinsen					
3. Tilgung					
4. Verwaltungs	ausgaben (laufende Ausgaben für				
Material, Tel	efon, Porto, usw.)				
5. Versicherun	gen				
6. Steuern					
VI. Zustiftungen					
1. Zuführung z	um Stiftungsvermögen				
Summe Ausgaben					
Einnahmen gesam	t				
./. Ausgaben gesamt					
Jahresüberschus	s/Jahresfehlbetrag				

bis

Nachrichtlich:

Verwendung des Überschusses (+) Behandlung des Fehlbetrages (-)

=

Stiftungsvermögen zweckgebundene Rücklagen freie Rücklage Mittelvortrag Gesamtsumme



Protokolle 2023 (Vorstand und Beirat)



Neuffenstraße 57 D-73734 Esslingen am Neckar

12.1.23

Protokoll zur zweiten gemeinsamen Sitzung von Vorstand und Beirat am Dienstag, den 10. Januar, 2023 um 18.00 Uhr (VIA ZOOM)

<u>Protocol</u> of the second joint meeting of the Executive Board and the Advisory Board on Tuesday, January 10th 2023 at 6.30 p.m. CET (VIA ZOOM)

Anwesend/*present*: Monika Schweizer, Klára P. Fischl, Stella Souvatzi, Leonie C. Koch, Jana Anvari, Joseph Maran, Antonio Blanco-González,Tobias L. Kienlin (Vorstand und Beirat vollständig, Beirat beschlussfähig/*both boards fully present and quorate*) Beginn: 18.30 Uhr – Ende: 19.20 Uhr

TOP 1: Begrüßung, Feststellung der Tagesordnung und satzungsgemäßen Ladung Welcome, determination of the agenda and statutory summons

Begrüßung, Dank für die Bereitschaft aller Anwesenden sich für die Stiftung zu engagieren. Tagesordnung und Ladung werden einstimmig gebilligt; es gibt keine Ergänzungswünsche zur Tagesordnung

Welcome, thanks for the willingness of all present to commit themselves to the foundation. The agenda and invitation were unanimously approved; there were no requests for additions to the agenda

TOP 2: Aussprache über die vorliegenden Anträge, deren (wissenschaftliche) Qualität, Arbeitsplan und Finanzvolumen, sowie ihre Deckung mit dem Stiftungszweck; ggf. Formulierung einer Förderempfehlung

Discussion of the applications submitted, their quality, work plan and financial volume, as well as their compliance with the foundation's purpose; if applicable, formulation of a funding recommendation

Erläuterung zur Vorgehensweise; die Aussprache über die im Vorfeld zirkulierten Anträge soll neben der üblichen Beurteilung deren fachlicher Qualität immer auch deren Passung auf den Stiftungszweck und die geplante strategische Ausrichtung der Fördertätigkeit der Stiftung umfassen.

Explanation of the procedure; the discussion on the applications circulated in advance should always include, in addition to the usual assessment of their professional quality, their fit with the foundation's purpose and the planned strategic orientation of the foundation's funding activities.

TOP 2A: Time Will Tell: The Vésztő-Mágor Conservation and Exhibition Program 2023 (Attila Gyucha et al.; 17,414 € / 2023; mehrjährig / *up to four years*)

Es handelt sich um den angekündigten Fortsetzungsantrag eines bereits 2022 geförderten Projektes. Die 2022 erfolgten Arbeiten konnten von Fischl/Kienlin im Rahmen einer Exkursion in Augenschein genommen werden und werden als hoch professionell eingestuft. Nach wie vor gilt, dass dieser Antrag mit seinem Fokus auf der Instandsetzung und musealen Präsentation der Profile der Altgrabung von Vésztő-Mágor (Ungarn) in besonderem Maße dem Anliegen der Stiftung entspricht, einen Beitrag zur Erhaltung prähistorischer, hier neolithischer Tellsiedlungen zu leisten. Als problematisch werden die angestrebte Laufzeit und der noch einmal um die Sanierung der Betonüberdachung erweiterte Projektumfang angesehen, der die Möglichkeiten der Stiftung allein übersteigt. Konkret für 2023 werden einzelne Posten für zu hoch angesetzt angesehen und zur Kürzung vorgeschlagen. Es wird die Notwendigkeit betont, den Antragsstellern zu signalisieren, dass keine Garantie betreffs einer weiteren Förderung in den Folgejahren gegeben werden kann. Für 2023 wird das Projekt einstimmig als förderwürdig angesehen und zur Förderung empfohlen.

This is the previously announced follow-up application of a project already funded in 2022. The work carried out in 2022 was visited by Fischl/Kienlin during an excursion in summer and is considered to be highly professional. It is still true that this application, with its focus on the restoration and museum presentation of the profiles of the old excavation of Vésztő-Mágor (Hungary), is particularly in line with the foundation's concern to contribute to the preservation of prehistoric, in this case Neolithic, tell settlements. However, the targeted duration and the project scope, which has been extended to include the renovation of the concrete roofing, are considered problematic, as they may exceed the foundation's possibilities alone. Specifically for 2023, individual items are considered too costly and proposed for reduction. The necessity to signal to the applicants that no guarantee can be given regarding further funding in the following years is emphasised. For 2023 the project is unanimously considered worthy of funding and recommended for funding.

TOP 2B: Archäomagnetische Prospektion und archäologische Sondierung spätneolithischer Siedlungen im unteren Theißgebiet (Robert Hofmann et al.; 19,880 € / 2023)

Dem beantragten Projekt wird hohe wissenschaftliche Qualität und generelle Förderwürdigkeit bescheinigt, obgleich der vorliegende Antrag nicht speziell auf das Antragsformat der Stiftung zugeschnitten wurde. Angesichts der beschränkten Fördermittel, der Förderung eines vergleichbar angelegten Projektes neolithischer Zeitstellung in der Region und der als gut angesehenen Möglichkeiten des Kieler Instituts anderweitig eine Finanzierung sicherzustellen spricht sich der Beirat jedoch einstimmig gegen eine Förderung dieses Projekts aus.

The project applied for is considered as being of high scientific quality and generally worthy of funding, although the present application was not specifically tailored to the foundation's application format. However, in view of the limited amount available for funding in 2023, the funding of a comparable project of Neolithic date in the region, and the Kiel Institute's possibilities to secure funding elsewhere, which are considered good, the advisory board unanimously speaks out against funding this project.

TOP 2C: The organization and dissolution of the Bronze Age community of Kajászó (Tamas Polanyi; 19,100 € / 2023)

Der Mikroregion mit Siedlung und Nekropole um Kajászó, ein *off-spring* des Bentatal-Projektes, wird große wissenschaftliche Bedeutung beigemessen und generelle Förderwürdigkeit bescheinigt. Im Vergleich mit anderen vorliegenden Projektskizzen wird jedoch negativ vermerkt, dass die Kalkulation des Projekts zu pauschal bleibt, so etwa hinsichtlich der Anzahl und Herkunft der Teilnehmer an den geplanten Kampagnen und der daraus sich ergebenden Kosten, und nicht speziell auf das Antragsformat der Stiftung zugeschnitten wurde. Vermeidbare Posten ergeben sich offenbar aufgrund des Fehlens einer lokalen Partnerinstitution und des Versuchs, dieses

Projekt im Wesentlichen aus den USA heraus durchzuführen. Angesichts der beschränkten Fördermittel, der angesprochenen Monita und der Förderung eines vergleichbar angelegten Projektes bronzezeitlicher Zeitstellung in der Region spricht sich der Beirat einstimmig gegen eine Förderung dieses Projekts aus.

The microregion with settlement and necropolis around Kajászó, an off-spring of the Benta Valley project, is considered to be of great scientific importance and generally worthy of funding. In comparison with other available project outlines, however, it is noted negatively that the calculation of the project remains too general, for example with regard to the number and origin of participants in the planned field campaigns and the resulting costs, and was not specifically tailored to the foundation's application format. Avoidable items appear to arise due to the lack of a local partner institution and the attempt to run this project essentially out of the US. In view of the limited funding available for 2023, the monita mentioned and the funding of a comparable project of Bronze Age date in the region, the advisory board is unanimously against funding this project.

TOP 2D: Chronology, society and environment of the Neolithic tells in Pelagonia (Goce Naumov et al.; 20,000 € / 2023; mehrjährig / *up to three years*)

Es handelt sich um den angekündigten Fortsetzungsantrag eines bereits 2022 geförderten Projektes. Die laut des vorliegenden Berichts 2022 erfolgten Arbeiten werden als erfolgreich bewertet. Dem beantragten Projekt wird nachwievor hohe wissenschaftliche Qualität bescheinigt und das Potential einen entscheidenden Beitrag zur Erforschung einer bislang nicht ausreichend verstandenen prähistorischen Siedlungslandschaft und ihrer Tellsiedlungen zu leisten. Negativ wird vermerkt, dass der Antrag wie bereits im Vorjahr nur notdürftig auf die Möglichkeiten (Fördervolumen, Laufzeit) der FSPT abgestimmt wurde. Die Erweiterung um einen weiteren Fundort, der akut von der Zerstörung bedroht ist, zwar als nachvollziehbar angesehen, es werden jedoch Zweifel am Vorhandensein einer langfristigen Strategie und tellspezifischen Fragestellung jenseits der möglichst umfassenden Abdeckung der Landschaft Pelagonien geäußert. Dessen ungeachtet wird eine erneute Förderung des Projekts als wünschenswert angesehen, insbesondere auch hinsichtlich des breiten vorgesehenen Methodenkanons, der bislang so in dieser Region noch keine Anwendung gefunden hat und noch wesentliche Erkenntnisfortschritte verspricht. In Hinblick auf die Mehrjährigkeit des geplanten Vorhabens wird jedoch nochmals die Notwendigkeit betont, den Antragsstellern zu signalisieren, dass keine Garantie betreffs einer weiteren Förderung in den Folgejahren abgegeben werden kann und eine inhaltliche Fokussierung wünschenswert wäre. Das Projekt wird einstimmig als förderwürdig angesehen und zur Förderung empfohlen.

This is the previously announced follow-up application of a project already funded in 2022. The work carried out in 2022 according to the report provided is assessed as successful. The proposed project is still considered to be of high scientific quality and to have the potential to make a decisive contribution to research into a prehistoric settlement landscape and its tell settlements that has not been sufficiently understood to date. On the negative side, it is noted that, as in the previous year, the application was only poorly coordinated with the possibilities (funding volume, duration) of the FSPT. Although the addition of another site, which is acutely threatened by destruction, is considered understandable, doubts are expressed about the existence of a longterm strategy and tell-specific questioning beyond the as comprehensive as possible coverage of the Pelagonian Neolithic landscape and sites aimed at. Nevertheless, renewed funding of the project for 2023 is considered desirable, especially with regard to the broad canon of methods envisaged, which has not yet been applied in this region and promises significant progress in knowledge. In view of the multi-annual nature of the planned project, however, the need to signal to the applicants that no guarantee can be given with regard to further funding in subsequent years is emphasised once again. Further it is emphasised that would be desirable to refocus the approach and aims of the project if further applications to the foundation are considered. For 2023 the project is unanimously considered worthy of funding and recommended for funding.

TOP 2E: Geophysical project on the prehistoric tell settlement of Berettyóújfalu-Herpály (Pál Raczky; 7,500 € / 2023)

Es handelt sich um einen Neuantrag begrenzten Umfangs, der aus der Notwendigkeit heraus motiviert ist, die im Rahmen einer ausgelaufenen Kooperation begonnene geomagnetische Prospektion des wichtigen Fundortes Berettyóújfalu-Herpály zu einem erfolgreichen Abschluss zu bringen. Es wird bemängelt, dass das vorliegende Dokument vollumfänglich den formalen Anforderungen an einen Antrag entspricht. Anliegen und Kostenvoranschlag der geplanten Arbeiten sind jedoch klar nachzuvollziehen. In der Aussprache wird das langjährige Engagement des Antragsstellers für die Erforschung des Spätneolithikum in Ostungarn gewürdigt und das Potential seiner Arbeitsgruppe als hoch angesehen, mit einem entsprechenden Zuschuss die Arbeiten in Berettyóújfalu-Herpály zu einem guten Abschluss zu bringen. Perspektivisch wird auch der langfristig erkennbare Versuch des Antragsstellers hervorgehoben, sich für den Erhalt der von ihm erforschten Tellsiedlungen einzusetzen, so durch den Erwerb und Unterschutzstellung des Fundortes Polgár-Csöszhalom. Der Antrag wird einstimmig als förderwürdig angesehen und zur Förderung empfohlen.

This is a new application of limited scope, motivated by the need to bring the geomagnetic prospection of the important Berettyóújfalu-Herpály site, which was started within the framework of an expired cooperation, to a successful conclusion. It is criticised that the present document does not fully comply with the formal requirements for an application. However, the concerns and cost estimate of the planned work are clearly comprehensible. In the discussion, the long-standing commitment of the applicant to the research of the Late Neolithic in Eastern Hungary is appreciated and the potential of his working group is considered high to bring the work in Berettyóújfalu-Herpály to a good conclusion with a corresponding grant. In perspective, the long-standing engagement of the applicant to work for the preservation of the tell settlements researched by him is also emphasised, for example through the acquisition and protection of the Polgár-Csöszhalom. The application is unanimously considered worthy of support and recommended for funding.

TOP 2F: The very end of Tell Tsaf and the WHY question (Danny Rosenberg; 20,000 € / 2023)

Gegenstand dieses Neuantrags sind die letzten Phasen und das Ende des wichtigen chalkolithischen Fundortes Tell Tsaf in Israel. Es wird hervorgehoben, dass hiermit eine konkrete tellbezogene Fragestellung vorliegt, eben das Abbrechen dieser spezifischen ortsstabilen Lebensform zugunsten kurzfristiger belegter Ansiedlungen, eine Frage im Spannungsfeld kultureller Faktoren wie des bewussten Traditionsbezugs und ökodeterministischer Betrachtungsweisen, die gegenwärtig wieder an Popularität gewinnen. Negativ vermerkt wird die Diskrepanz zwischen diesem Anliegen, das mit einem Kanon relevanter naturwissenschaftlicher Methoden untersucht werden soll, und der beigefügten Kalkulation, die im wesentlichen die Vollfinanzierung der entsprechenden Ausgrabungen vorsieht und nicht auf die auf die Möglichkeiten (Fördervolumen, Laufzeit) der FSPT abgestimmt wurde. Aus diesem Grund wird vollumfängliche Förderung gemäß dem Antrag abgelehnt. Die Projektidee und Frage nach dem Ende der Lebensweise Tell wird jedoch als förderwürdig angesehen und vorgeschlagen in beschränktem Umfang Mittel für die Durchführung der grabungsbegleitend geplanten naturwissenschaftlichen Untersuchungen wie Mikromorphologie oder Paläobotanik zu bewilligen. The subject of this new application are the last phases and the end of the important Chalcolithic site of Tell Tsaf in Israel. It is emphasised that this project features a specific tell-related question, i.e. the end of long-term commitment to specific places and the transition to settlements occupied for a shorter period of time only. Such questions are discussed in the field of tension between cultural factors such as the conscious reference to tradition and ecodeterministic approaches, which are currently gaining in popularity again. The discrepancy between this concern, which is to be investigated with a canon of relevant scientific methods, and the subsequent calculation, which essentially provides for the full funding of the corresponding excavations and was not adapted to the possibilities (funding volume, duration) of the FSPT, is noted negatively. For this reason, full funding according to the application is rejected. However, the project idea and the question of the

end of tell-living are considered worthy of funding, and it is proposed that limited funding be granted for the implementation of the scientific investigations planned to accompany the excavations, such as micromorphology or palaeobotany.

TOP 2G: Archäobotanische Untersuchungen in Borosdivánka-Nagyhalom (Ungarn) (Tanja Zerl; 6,000 € / 2023; zweijährig / *two years*)

Es handelt sich um den angekündigten Fortsetzungsantrag der bereits im Jahr 2022 geförderten Auswertung der botanischen Großreste aus der Tellgrabung von Borsodivánka-Nagyhalom in Nordostungarn. Neben den guten Erhaltungsbedingungen und dem umfangreichen Datenbestand wird besonderes wissenschaftliches Potential in dem dadurch möglichen Vergleich der Wirtschaftsweise, Subsistenzstrategien und Umweltbedingungen von Borsodivánka mit dem Tell von Toboliu im benachbarten Rumänien gesehen, dem sich ein verwandtes Kölner Projekt widmet. Das Projekt wird einstimmig als förderwürdig angesehen und zur Förderung empfohlen. *This is the previously announced follow-up application of the evaluation of the large body of botanical remains from the tell excavation of Borsodivánka-Nagyhalom in north-eastern Hungary, which was already funded in 2022. In addition to the good preservation conditions and the extensive data stock, special scientific potential is seen in the consequent possibility to compare economic strategies, subsistence strategies and environmental conditions of Borsodivánka with the tell of Toboliu in neighbouring Romania, which is the focus of a related Cologne project. The project is unanimously considered worthy of support and recommended for funding.*

TOP 2H: A multi-method toolkit to study burnt daub (Jana Anvari et al.; 6,061 € / 2023)

Gegenstand dieses Neuantrages von geringem Umfang ist die Entwicklung eines Methodenkanons für das systematische Studium prähistorischen Hüttenlehms mittels archäologischer und naturwissenschaftlicher Methoden am Beispiel des Materials von neolithischen und bronzezeitlichen Tellsiedlungen in Südosteuropa. Angestrebt ist damit zugleich der diachrone Vergleich tellspezifischer Architektur- und Baupraktiken. Das Projekt wird als innovativ und von potentiell großer Bedeutung für das zukünftige Studium dieses oftmals vernachlässigten Fundmaterials von prähistorischen Tellsiedlungen angesehen. Das Projekt wird einstimmig als förderwürdig angesehen und zur Förderung empfohlen.

The object of this new application of small scope is the development of a canon of methods for the systematic study of prehistoric daub by means of archaeological and scientific methods using the example of material from Neolithic and Bronze Age tell settlements in south-east Europe. At the same time, the project aims at a long-term comparison of tell-specific architectural and building practices. The project is considered innovative and of potentially great importance for the future study of this often neglected category of find material from prehistoric tell settlements. The project is unanimously considered worthy of support and recommended for funding.

TOP 3: Verschiedenes *Miscellaneous*

Allgemeine Aussprache über die Fördergrundsätze und den Umgang mit Anträgen, die zum Teil nicht gut auf Möglichkeiten der Stiftung abgestimmt sind (Volumen, Laufzeit etc.). Es wird festgehalten, dass natürlich auch größere traditionelle Ausgrabungsprojekte anteilig finanziert werden können, aber Projekte zu bevorzugen sind, die auch auf theoretischem Gebiet in ihrer Fragestellung einen besonderen Beitrag zum Verständnis der Lebensweise Tell erhoffen lassen. *General discussion about the funding principles and the handling of applications, some of which are not well adapted to the possibilities of the foundation (volume, duration, etc.). It is stated that traditional excavation projects can of course also be financed proportionally, but that preference should be given to projects that also make a special contribution to the understanding of tell-living in the theoretical field.* Mit freundlichen Grüßen, With best wishes,

Euer

T. Uil

(Tobias L. Kienlin)



Neuffenstraße 57 D-73734 Esslingen am Neckar

14.1.23

<u>Protokoll zur</u> <u>3. ordentlichen Sitzung des Vorstandes</u> am Dienstag, den 10. Januar 2023, um 19.30 Uhr <u>(VIA ZOOM)</u>

Anwesend: Monika Schweizer, Klára P. Fischl, Leonie C. Koch, Joseph Maran, Tobias L. Kienlin (Vorstand vollständig und beschlussfähig) Beginn: 19.30 Uhr – Ende: 20.30 Uhr

TOP 1: Begrüßung, Feststellung der Tagesordnung und satzungsgemäßen Ladung

Beide Punkte werden einstimmig gebilligt; es gibt keine Ergänzungswünsche zur Tagesordnung

TOP 2: Aussprache und Beschlussfassung über eine Satzungsänderung

Ergänzend zu den jährlichen Förderrichtlinien wird vorgeschlagen, auch die Satzung dahingehend zu ergänzen, dass die Mitglieder von Vorstand und Beirat grundsätzlich antragsberechtigt sind, aber höchstens die Hälfte der jährlichen Fördersumme an Projekte unter Beteiligung der entscheidungsberechtigten Vorstandsmitglieder gehen darf.

Es wird vorgeschlagen, diese Präzisierung in §6 Stiftungsorgane, Absatz 2 aufzunehmen:

(2) Die Mitglieder der Stiftungsorgane sind grundsätzlich ehrenamtlich für die Stiftung tätig. Sie haben Anspruch auf Ersatz angemessener Auslagen; diese können auch pauschaliert werden. Die Mitglieder von Vorstand und Beirat sind antragsberechtigt. Es dürfen maximal 50 % der jährlichen Fördersumme für Projekte unter Beteiligung von oder in Verbindung mit Mitgliedern des Vorstandes verausgabt werden.

Die Satzungsänderung wird einstimmig beschlossen. Kienlin wird beauftragt diese dem Regierungspräsidium zur Genehmigung vorzulegen.

TOP 3: Bericht über die Finanz- und Ertragslage der Stiftung 2022 und Beschlussfassung über die Höhe der Fördersumme für das Jahr 2023

Mit einem Nettoertrag aus dem Stiftungsvermögen von 12.618 Euro ist das Jahr 2022 bedingt durch die Ukrainekrise weit hinter den Erwartungen zurückgeblieben. Um die Kontinuität der Stiftungsarbeit in dieser für die Profilbildung der FSPT wichtigen Anfangsphase zu gewährleisten und die avisierte Fördersumme von rund 40.000 Euro zu erreichen, bietet Kienlin an, die Fördertätigkeit der Stiftung im Jahr 2023 nochmals durch eine Spende in Höhe von 30.000 Euro zu unterstützen. Dieser Vorschlag wird vom Vorstand einstimmig angenommen und die Fördersumme für 2023 auf 42.000 Euro festgesetzt.

TOP 4: Aussprache über die Empfehlungen des wissenschaftlichen Beirats zu den Anträgen für das Jahr 2023 und die zukünftige Förderstrategie der Stiftung

Nach der vorangegangenen gemeinsamen Sitzung mit dem wissenschaftlichen Beirat wird an dieser Stelle kein weiterer Aussprachebedarf gesehen.

TOP 5: Beschlussfassung über die im Jahr 2023 zu fördernden Projekt sowie das Finanzvolumen der jeweiligen Förderung

Entsprechend der Empfehlungen des wissenschaftlichen Beirats wird beschlossen, sechs der beantragten acht Projekte zu fördern, wobei es sich bei dreien dieser Projekte um Fortsetzungsanträge bereits 2022 geförderter Vorhaben handelt (Anträge Attila Gyucha et al., Goce Naumov et al. und Tanja Zerl) und drei weitere Neuanträge Berücksichtigung finden (Anträge Jana Anvari et al., Pál Raczky und Danny Rosenberg).

Zwei der bewilligten Projekte werden im vollen Umfang der beantragten Summen gefördert (Anträge Jana Anvari et al. und Tanja Zerl), während bei den übrigen Kürzungen gegenüber der beantragten Fördersumme vorgenommen werden (Anträge Attila Gyucha et al., Goce Naumov et al., Pál Raczky und Danny Rosenberg).

Bei den Projekten Attila Gyucha et al. und Goce Naumov et al. wird auf detaillierte Vorgaben, an welcher Stelle Kürzungen vorzunehmen sind, bewusst verzichtet. Bewilligt wird eine Gesamtsumme, deren konkrete Verwendung für die in den Anträgen genannten Posten den Antragstellern anheim gestellt wird. Bei dem Projekt Danny Rosenberg wird entsprechend der Empfehlung des Beirats eine vollumfängliche Förderung der geplanten Ausgrabungen gemäß des Antrags abgelehnt. Stattdessen werden zweckgebunden Mittel für die Durchführung der grabungsbegleitend vorgesehenen naturwissenschaftlichen Untersuchungen wie etwa Mikromorphologie oder Paläobotanik bewilligt.

Im Einzelnen werden also gefördert:

A multi-method toolkit to study burnt daub (Jana Anvari et al.) mit einer Fördersumme von **6.000** Euro für das Jahr 2023.

Time Will Tell: The Vésztő-Mágor Conservation and Exhibition Program (Attila Gyucha et al.) mit einer Fördersumme von **10.000** Euro für das Jahr 2023.

Chronology, society and environment of the Neolithic tells in Pelagonia (Goce Naumov et al.) mit einer Fördersumme von **10.000** Euro für das Jahr 2023.

Geophysical prospection on the prehistoric tell settlement of Berettyóújfalu-Herpály (Pál Raczky) mit einer Fördersumme von **4.500** Euro für das Jahr 2023.

The very end of Tel Tsaf and the WHY question (Danny Rosenberg) mit einer zweckgebundenen Fördersumme für begleitende naturwissenschaftliche Untersuchungen von **5.500** Euro für das Jahr 2023.

Archäobotanische Untersuchungen in Borsodivánka-Nagyhalom (Ungarn) (Tanja Zerl) mit einer Fördersumme von **6.000** Euro für das Jahr 2023.

TOP 5: Verschiedenes

Kienlin wird beauftragt die Antragsteller über die Förderentscheidung gemäß des vorliegenden Protokolls in Kenntnis zu setzen, verbunden, im Erfolgsfall, mit dem Hinweis auf die Förderbedingungen gemäß Förderrichtlinie der FSPT (Version 2023).

In Hinblick auf die Mehrjährigkeit einiger der geförderten Vorhaben wird die Notwendigkeit betont, den Antragsstellern zu signalisieren, dass keine Garantie betreffs einer weiteren Förderung in den Folgejahren gegeben werden kann.

Mit freundlichen Grüßen,

Till

(Tobias L. Kienlin)



Geförderte Projekte 2023

Time Will Tell: The Vésztő-Mágor Conservation and Exhibition Program 2023

Principal Investigators:

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Academic Sponsor:

University of Georgia Research Foundation, Inc. 310 East Campus Rd, Tucker Hall 409 Athens, GA 30602-1589

Project Dates: July 3, 2023 – July 31, 2023 Project Location: Vésztő, Hungary Amount Requested: 17,416 €

Overhead Costs:

The University of Georgia Research Foundation, Inc. acknowledges the Foundation for the Study and Preservation of Tells in the Prehistoric Old World's restriction for overhead costs, and no overhead cost will be applied to this grant.

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SUMMARY

In this proposal, we request funding for the continuation of the *Time Will Tell: Vésztő-Mágor Conservation and Exhibition Program* (henceforth, Program). This multi-year program aims to stabilize, preserve, and rejuvenate the exhibition of a unique, *in situ* trench excavated into the largest tell on the Great Hungarian Plain, Vésztő-Mágor. The tell is part of an archaeological and historical park, the Vésztő-Mágor National Historical Park (henceforth, Park), that has an outstanding cultural significance and economic weight for the local and regional community.

As spatially concentrated time capsules of long cultural trajectories, tells are ideal settings not only for exploring prehistoric developments but they also have an extraordinary potential to become centers of public engagement and education that benefit local and regional communities. However, methodologies of how to preserve and exhibit excavated trenches at tell sites currently do not exist. Generous support from the Foundation for the Study and Preservation of Prehistoric Tells in the Old World allowed us to launch the field component of the Program in 2022.

The Program incorporates multiple phases. The current proposal specifically seeks funding for the continuation of the stabilization of the crumbling stratigraphic profiles and the conservation of the exposed features and displayed artifacts. Our activities in Summer 2023 will focus on the northern and central sections of the *in situ* exhibition. Upon the completion of conservation and stabilization procedures across the trench the built shelter that covers the trench will be repaired, and a climate control system and an environmental monitoring system will be installed to ensure the long-term preservation of the exhibition. Finally, the most advanced technologies and tools will be utilized to rejuvenate the exhibition to enhance visitor engagement and attract more visitors to the Park.

The Park is an integral part of the local community and the Program will help ensure that it will be preserved as a thriving center for local identity and regional congregation. Additionally, the Program will promote the preservation of tells and their presentation to the public elsewhere in the world and will establish best practice guidelines for conservation and exhibition procedures in similar *in situ* contexts.

The Program is an organic continuation of our previous research activities at Vésztő-Mágor, and across the Körös region, adding a heritage protection component of marked importance to it. We consider the Program to be our contribution to the community of Vésztő, which has supported our research in the area wholeheartedly over the past two decades.

THE CONTEXT

The Tell of Vésztő-Mágor: History and Significance

Encompassing an area of 4.25 ha and rising 9 m above a Körös river terrace, Vésztő-Mágor is the largest tell on the Great Hungarian Plain (Figure 1). Currently, the site includes two mounds that in prehistory constituted a single prehistoric tell (Figure 2). Archaeological research at Vésztő-Mágor began at the end of the 1960's to explore both the Medieval Age monastery located on the southern mound and prehistoric developments across the tell (Figure 3; Frolking 2021; Gyucha et al. 2011; Hegedűs and Makkay 1987; Juhász 2000; Makkay 2004; Parkinson et al. 2018; Sarris et al. 2013).

These investigations indicate that prehistoric occupation encompassed approximately 4,000 years at the site. Habitation started during the Middle Neolithic, in the later sixth millennium BC, and continued into the Late Neolithic. About 4600 BC, Vésztő-Mágor was abandoned but reoccupation took place ca. 4500/4400 BC, in the Early Copper Age. After a long hiatus, the transitional period between the Early and Middle Bronze Age, around 1900 BC, witnessed the final occupation phase in the prehistoric development of the site that lasted several hundred years (Ecsedy et al. 1982:183–187; Hegedűs 1977; Makkay 2004). A total of 7 m stratified cultural deposits formed in the center of the tell, with the Neolithic layers measuring up to 3.5–3.7 m, the Copper Age layers 0.9–1 m, and the Bronze Age layers a maximum of 2 m, with buried 'A' horizons following each major period. Between the eleventh and fourteenth centuries AD, a monastery was constructed in the southern zone of the site, on top of the Bronze Age layers (Hegedűs and Makkay 1987, 1990).

The In Situ Trench at Vésztő-Mágor: Significance and Problems

Besides its historical significance, a unique, *in situ* exhibition makes Vésztő-Mágor truly exceptional. In 1982, across an area of 13 ha, including the tell, the Vésztő-Mágor National Historical Park (henceforth, Park; https://www.vesztomagor.hu/) was founded. In addition to setting up a museum in a 19th-century wine cellar in the southern section of the tell, a 19-x-4.5-m trench was opened in 1986 specifically to create the *in situ* exhibition (see Figures 3 and 4; Makkay 2004).

During the archaeological works in 1986, a section of the northern zone of the tell was excavated to various depths, and archaeological features and objects representing each prehistoric

period at the site were left exposed (Figure 5). The excavation was followed by the construction of a permanent, closed shelter over the *in situ* trench to protect the archaeological remains and facilitate public access. This exhibition quickly became the most frequently visited attraction of the Park, which hosts about 12,000 visitors every year. These visitors contribute significantly to the economic prosperity of the nearby farming town of Vésztő, home to 7,000 people.

Over the past few decades, however, the exposed profiles of the *in situ* exhibition have dried out, crumbled, and even collapsed in many areas. In order to halt the crumbling process, the Park applied clay plaster renders on several profiles about 10-15 years ago. These plaster renders separated and further destroyed the profiles and our attempt in 2014 to apply chemicals also proved to be an inadequate approach for preserving the trench. However, the same year, we also cut back a 5-meter-long profile section and its regular water spraying appeared to have been a promising method to prevent new crumbling episodes from occurring.

In 2021, to systematically explore mitigation opportunities, and preserve and rejuvenate the exhibition in the *in situ* trench, an international team of archaeologists and conservators established the Vésztő-Mágor Conservation and Exhibition Program (henceforth, Program).

THE PROGRAM

Program Significance, Goals, and Itinerary

In addition to directly benefiting the local and regional community of Vésztő and the Körös region, the Program also is an opportunity to build knowledge of long-term conservation opportunities in preserved tell trenches. Excavations of tell sites are extremely time-consuming and costly, however, owing to the lack of research into how the fragile earthen profiles and features can adequately be stabilized and maintained, trenches and blocks opened on tells are backfilled at the end of the excavation campaigns. Thus, despite massive effort and expense, the social utility of tell research has rarely exceeded the circles of specialists, the results have remained largely unknown for the general public, and the local and regional communities have not benefited from these archaeological works. The Program aims to offer resolutions to these problems.

In addition to preserving the *in situ* trench at Vésztő-Mágor and developing conservation techniques and procedures applicable to other tell sites, we will generate a state-of-the-art exhibition to increase visitor engagement and access to knowledge. To achieve these goals, the Program is divided into three distinct phases. The first two phases intend to ensure the stabilization

and long-term preservation of the exposed tell profiles, archaeological features, and displayed objects, while the third phase incorporates the development of a new exhibition for the *in situ* trench.

Below, we summarize the methods and results of our first fieldwork season in 2022 and provide details concerning additional Phase I activities proposed for Season 2023, for which we seek funding through this proposal. Then, subsequent Phase II to III activities will be briefly outlined. Note that we have secured funding from the Faculty Research Grants in Humanities and Arts Program at the University of Georgia (UGA) to partially cover Season 2023 (USD7,000 for travel for Gyucha, Riebe and 2 UGA students, meals and lodging for 2 UGA students, and pulley construction). To accomplish the rest of Phase I, as well as Phase II to III, activities, we will apply to the Foundation for the Study and Preservation of Tells in the Prehistoric Old World (FSPT) and other grants, including the National Endowment for the Humanities (NEH), the Archaeological Institute of America (AIA), and Hungarian and EU heritage protection and cultural infrastructure grants. For the analyses of the materials and samples from Phase I profile excavations, as well as for a related initiative to scientifically assess materials from previous and current excavations at Vésztő-Mágor, funding has been and will be requested from the PIs' institutions, the National Science Foundation, the Hungarian Scientific Research Fund, and the Wenner-Gren Foundation.

Phase I: Stabilization, Conservation, Environmental Data Collection

In our proposal submitted to FSPT in 2021, we assumed that two seasons, which we called Phases I and II, would be sufficient to implement profile stabilization and conservation throughout the *in situ* trench at Vésztő-Mágor. During Season 2022, however, we encountered preservation problems and stabilization challenges that required time-consuming resolutions. Therefore, we believe that completion of Phase I will realistically require a minimum of three seasons. Throughout these years, environmental studies will be conducted in order for Phase II interventions to be informed by data collected through cutting edge, evidence-based research.

Season 2022: Summary of Methods and Results

Conservation Interventions

In Season 2022, we focused our work on the most deteriorated, northern section of the *in situ* trench. Based on a site condition survey conducted at the beginning of the season, three major

approaches were specified concerning potential conservation methods of earthen profiles and platforms: 1) cutting back profiles featured by better retention; 2) constructing sacrificial support structures in heavily eroding sections; and 3) applying a grouting mixture to counteract sheering in areas at risk of collapse. For documentation purposes, letter IDs were assigned to each profile and platform exposed during the 1986 excavation (Figure 6).

Cutting back profiles. After the removal of clay renders installed by the Park (see above), we cut back the eastern (Area C) and northern (Area A) profiles by about 10 cm. Our goal was to remove crumbling, dried out sections and produce even vertical surfaces with highly visible stratigraphic layers (Figures 7 and 8). As Areas A and C profiles still seem to be unstable due to their low moisture content, changes in their condition will be documented in the following years, and if necessary, further stabilization interventions will be implemented.

Constructing sacrificial support structures. Once clay renders constructed over the western profile of the trench by the Park were removed, extremely poor profile retention was observed in Areas B and I. Severe basal deterioration and extremely porous and friable soil structure, which could lead to major collapses and accidents, prevented this profile from being cut back. Instead, we decided to build an extensive sacrificial support structure using mudbricks made of the tell's own soil by adding water, aged chaff, and perlite (Figures 9 and 10). This structure aimed to provide support for the delicate section and to prevent further deterioration that could threaten the preservation of the entire *in situ* trench and possibly the shelter. The structure was designed to be permeable enough for moisture and soluble salts to pass through to the surface. Before the mudbricks were mortared into position, the original archaeological profile was lined with geotextile. A similar supporting earthen brick wall also was built in the crumbling and collapsing sections of two platforms (Areas D and F).

Sheering management. Filling of profile cracks and gaps with grout provides support for any area in danger of collapse. Additionally, this grout can be used to provide 'pillar' support and moulded to stratigraphy in areas where mudbrick support is not possible or appropriate. A grouting mix of Paraloid B44, screened soil from the trench, and perlite was used in Area F, as well as in Area H/G and Area J/G interfaces to prevent sheering.

Additional conservation activities. Staged artifacts, including pottery, stone, and faunal material, were temporarily removed and cleaned using deionised water and ethanol in the dig house. Features and objects that could not be removed from the trench were cleaned in place with acetone

to remove both excess polymer from previous consolidation and soil that had adhered to the surface. In addition, a deep, 1x1 m sondage in the southeastern part of the trench, excavated in 2014 in Area HH, which had frequently retained water from the water table was backfilled to mitigate the impact of moisture wicking occurring in this area. Finally, compact fluorescents lights above Areas D and E were changed to much cooler LEDs to mitigate any deterioration caused by extreme thermal fluctuations.

Environmental Data Collection

Data downloaded in Season 2022 from seven TGP-4500 Tinytag Plus 2 dataloggers, which we had placed across the trench in November 2021 to track environmental changes, indicates that temperature and relative humidity fluctuate extremely sharply in the northern and southern sections of the *in situ* trench. This is likely the leading cause of profile deterioration. Additionally, four soil moisture profile probes (Delta-T PR2/6), purchased using FSPT funding, were installed in Area W to record long-term changes in profile moisture content and understand how the trench environment is impacted by the surrounding soil and vice-versa (Figure 11).

Shelter Rehabilitation

During Season 2022, we invited a local structural engineering company (Construct Plan Ltd.), long-term partner of the Park, to assess the shelter's current condition and determine improvements that would enable constant environmental conditions to be maintained in the trench. In the absence of a blueprint of the shelter, a sondage was dug to expose the foundation of the building and examine structural stability (Figure 12). Some important conclusions included that water leakage must be mitigated near the entrance, permanently open vents must be transformed into lockable ones, and a double door needs to be installed. At the turn of November and December, the most urgent issue, the water leakage at the entrance, was assessed and construction interventions were completed by a local company to resolve this problem.

Archaeological Results

Although conservation interventions in the *in situ* trench takes first priority in the Program, we consider a research-based approach and the systematic collection of archaeological information to be vital. In Season 2022, we were able to explore the uppermost prehistoric, Bronze Age strata of the tell in the northern part of the trench. During the cutback of the eastern (Area C) and northern

(Area A) profiles, we macroscopically examined and documented the stratigraphy, as well as took radiocarbon, micromorphological, flotation, and sediment samples. The extremely poor condition of the western trench wall (Areas B and I; see above) severely limited its investigation. Over the course of the season, we also excavated, cleaned, and sampled the profiles of Areas F and H as well as the platforms of Areas D, E, G, M, and L.

We parsed the vertical stratigraphy visible in the Bronze Age components of the profiles into five stratigraphic groups, each of which contained multiple distinct deposits. Our data on the development and use of the Vésztő-Mágor tell in the Bronze Age testifies to the frequent renewal of buildings, particularly their floors and hearths (see Figure 8). In total, we were able to identify the remains of 2-5 buildings. In addition to similar construction and renewal practices at the scale of individual houses, our data also suggests a high degree of planning and coordination of space use at the settlement scale. Based on ceramic stylistic analysis, this part of the tell was in use during the transitional period of the Bronze Age Ottomány and Gyulavarsánd cultures. Medieval Age and/or modern features intrusive into the Bronze Age layers were also identified. Following the field season, photogrammetric modeling was carried out in July 2022 (Figure 13).

Public Outreach and Dissemination

We provided tours twice a week during the season for visitors and were interviewed by regional newspapers. In addition, we presented the preliminary results of Season 2022 at two international professional meetings in August and September: the BORBAS 10 Workshop and the 28th Annual Meeting of European Association of Archaeologists.

Season 2023: Continuation of Stabilization, Conservation, and Environmental Data Collection

This proposal specifically seeks funding for the continuation of our Phase I work in the *in situ* trench at Vésztő-Mágor. The season will take place from July 3 to July 31, 2023.

At the beginning of the season, we will compile a condition report to record the degree and nature of deterioration that have occurred throughout the *in situ* trench in the past year. For this purpose, we will utilize our closing photos in the Program's Conservation Database and the photogrammetric models produced at the end of Season 2022. During this process, we will pay particular attention to those areas that have been subject to conservation interventions in 2022 to scrutinize the effectiveness of the methods applied.

Throughout Season 2023, stabilization and conservation efforts will advance in the northern and central sections of the *in situ* trench. Final additions to the sacrificial support structure along the northwestern profile will be completed in Areas B and I, as well as in Areas D and F. A surface mortar layer will be employed on all of these renders to provide an even and consistent view for the visitors.

In Areas H, J, K, N, and O (see Figure 6), we will remove old clay renders, clear away crumbling sections, and cut back the profiles. Due to severe basal deterioration and friable sediment structure, the construction of sacrificial support structures to enhance the stability of some of these profiles may become necessary. Based on our experiences in Season 2022, we will in part mechanize, and thus expedite, mudbrick production and, as a result, concentrate most of our labor force on in-trench stabilization and conservation activities. In smaller areas across the *in situ* trench, we will apply a grouting mixture to rectify sheering subject to potential collapse. Additionally, the cleaning and restoration of the displayed objects and exposed features located in the northern and central sections will be completed.

Similar to last year, profile excavations will be conducted as a scientific archaeological investigation, and flotation, micromorphological, radiocarbon, and sediment samples will be collected for analyses; the excavation permit will be available by the middle of January 2023. Artifact processing and data management will occur daily at our research facility in Vésztő. For further details concerning field and laboratory methods, refer to our FSPT proposal in 2021. After the completion of field work, the recovered artifacts will be stored at the Munkácsy Mihály Museum in Békéscsaba and will be accessible to other scholars.

During Season 2023, we also will review the data collected over the course of a year by the TGP-4500 Tinytag Plus 2 dataloggers and the Delta-T PR2 soil probes. Specifically, we will explore micro-environmental trends across the trench and examine how our Season 2022 interventions impacted environmental conditions. This quantifiable research is instrumental in developing a long-term conservation management plan and for establishing adequate environmental and structural monitoring programs. These data also will be utilized to determine the technical parameters of a climate control system that will ensure optimal conditions for the preservation of the earthen architecture, features, and displayed artifacts in the *in situ* trench. Throughout Season 2023, we will continue recording our interventions in the Conservation Database, and photogrammetric models will be produced to record end-of-season conditions.

We will work with the Park and the Construct Plan Ltd. to compile a shelter rehabilitation plan in Season 2023. Construction design documentation, including operational steps and a quote for related expenses, will be produced by the end of Season 2023 and rehabilitation work will commence in 2024.

Finally, during Season 2023, Hungarian companies experienced in museum exhibition as well as in visual design, interactive multimedia, mobile applications, and other technological solutions will be invited to Vésztő-Mágor by the Park and the Program. The goal of these kick-off meetings is to discuss ideas about how to transform scientific data collected from the Vésztő-Mágor tell into captivating content for the public and to discuss how these contents could be conveyed using state-of-the-art methods in the new exhibition of the *in situ* trench.

Season 2024: Completion of Stabilization, Conservation, and Environmental Data Collection

During our field work in 2024, we will utilize experiences from Seasons 2022 and 2023 as well as data on changes in profile and environmental conditions tracked over multiple years. In addition, based on the construction design documentation compiled in 2023, passive environment building modifications (e.g., insulation, a double door, etc.) will be implemented. This work is not part of the current proposal, and funds will be requested from various sources in 2023.

Phase II: Establishment of Environmental Control and Monitoring

Based on the temperature, relative humidity, and soil moisture data collected over the course of three years (see above), in 2025, alterations to the internal shelter environment will be implemented in order to mitigate future deterioration of the exposed archaeological profiles, features, and artifacts. Potential options include, but are not limited to, the installation of a temperature and moisture control system, an automated sprinkling system, and a monitoring system to regulate environmental conditions. This work is not part of the current proposal, and funds will be requested from various sources for this phase in 2024.

Phase III: Exhibition Development

We have been collaborating with the Park to develop a new exhibition in the *in situ* trench. The trench is a perfect venue for innovative solutions and our goal is to fully exploit the opportunities offered. After inviting Hungarian companies experienced in creative solutions in museum exhibitions in 2023 (see above), we will solicit design concepts and quotes in 2024. We will work

closely with the Park to identify the best proposal and we will provide the Park with professional advice, grant writing, as well as managerial work to implement the exhibition. Grant proposals for the exhibition will be submitted in 2025, and the exhibition will be developed and opened in 2026. This work is not part of the current proposal.

Program Personnel

The core team from Season 2022 will work together in Season 2023. Table 1 outlines the responsibilities of key personnel (for CVs, see Appendix I). In addition to other specialists, nine students will participate in the Program in Summer 2023 (see Budget and Budget Justification).

Researcher	Affiliation	Responsibility	
Attila Gyucha	University of Georgia, Athens, GA, USA	Director, PI	
		Neolithic and Copper Age Specialist	
William A. Parkinson	Field Museum of Natural History and University	Director, Co-PI	
	of Illinois at Chicago, Chicago, IL, USA	Neolithic and Copper Age Specialist	
Paul R. Duffy	University of Kiel, Kiel, Germany	Director, Co-PI	
		Bronze Age Specialist	
Ashley Lingle	University of York, York, UK	Director, Co-PI, Conservation	
Jerrod Seifert	Cardiff University, Cardiff, UK	Director, Co-PI, Conservation	
Danielle J. Riebe	University of Georgia, Athens, GA, USA	Total Station and GIS	
István Pánya	Katona József Museum, Kecskemét, Hungary	Photogrammetry	

Table 1. Key personnel participating in Season 2023

THE IMPACT

Dissemination

A broad international audience, including archaeologists, conservators, and the general public, will be informed about the progress and results of the Program at Vésztő-Mágor. In addition to professional reports for the local cultural heritage office and the archives of the Hungarian National Museum and the regional Munkácsy Mihály Museum, reports will be made accessible to the general public through the PIs' institutional websites and the Program's website (koros.uic.edu) and Facebook page. We also will submit articles to peer-reviewed journals, such as *Journal of Cultural Heritage, Conservation and Management of Archaeological Sites, TERRA, European Journal of Archaeology*, and *Journal of Field Archaeology*, international magazines, such as *National Geographic Magazine*, and Hungarian magazines, such as *Magyar Régészet*. The data obtained during the Program will also be included in a monograph that synthesizes the results of previous and recent archaeological research at the Vésztő-Mágor tell. Program databases will be accessible to academics via a repository for research data on the open access website Zenodo (zenodo.org) and through the Archaeological Database of the Hungarian National Museum (archeodatabase.hnm.hu/en). Our goal is to integrate our digital data archives and maps so that other scholars can access our raw data and query it independently.

Similar to 2022 (see above), we will present our results in a variety of forums, including lectures for local and regional communities, at universities in Hungary, Great Britain, Germany, and the US, at the meetings of the ICOM-CC, the European Association of Archaeologists and the Society of American Archaeology, as well as Hungarian and other international symposia.

Broader Impacts

The Program is a vital step to preserving the Vésztő-Mágor tell as one of the most important prehistoric archaeological sites in southeastern Europe. Over the past decades, the exposed profiles in the *in situ* exhibition have crumbled to an extent that immediate action is required in order to preserve the tell from further decay and to keep this key element of the Park open for visitors. To enhance visitor engagement, the Program also provides an opportunity for the Park to develop a new exhibition showcasing the archaeological features and objects excavated in 1986 as well as exposed during the course of the Program.

Similar to Season 2022, in 2023, we will incorporate the local community into the Program to the greatest possible extent. In addition to hiring local entrepreneurs, purchasing locally produced goods, and using locally available services, with the assistance of the Park, we will advertise and provide tours twice a week to explain the goals and processes of the Program.

By sharing not only our experiences but also our equipment with other projects, the Program will promote and encourage the preservation and conservation of other prehistoric tell sites. In addition, our experiences will help us understand what works and what does not in these settings and will set the standards for similar future projects in Europe and beyond.

Last but not least, the farming community of Vésztő is economically dependent on the Park, with the number of annual visitors nearly doubling the population of the nearby town who visit not only the Park but utilize the services offered and purchase the goods produced and distributed in Vésztő. We expect that, as a result of the conservation of the *in situ* trench and the rejuvenated exhibition, as well as the broad publicity generated by the Program, the number of visitors of the Park will increase significantly in the years to come.

BUDGET AND BUDGET JUSTIFICATION

Field work will occur in Summer 2023 and will consist of a total of 28 days. In this proposal, we request funding for travel, meals, lodging, vehicle rental and gas, and photogrammetry modelling. The costs below include all taxes. Please note that due to financial uncertainties related to rising inflation and energy prices, as well as currency exchange rate fluctuations, the expenses below are estimates.

A) Travel. Airfare. Round-trip airfare will be provided for Lingle and Seifert and non-Hungarian student technicians, including 1 student from Germany and 3 students from the UK. Unit price based on an internet search in November 2022: 170 €/return ticket from Great Britain and Germany. Funds for airfare for Gyucha, Parkinson, Duffy, Riebe, and 2 US students are not being requested from FSPT. *Train tickets*. Three Hungarian students will be reimbursed for their train tickets. Unit price: 30 €/return ticket.

Total1,110 €

B) Meals. Meals will be provided by local caterers in Vésztő. We request funding from FSPT for lunches for 7 European students, Gyucha, Parkinson, Duffy, Riebe, Lingle, and Seifert at the local Varietas restaurant. Meals for 2 US students are not being requested from FSPT. Unit price: 12 €/person/day, total number of days: 28.

C) Lodging. Rooms and lab space will be provided at our long-term base, the Musli Sziget Panzió in Vésztő. Daily rate for 7 European students, Gyucha, Parkinson, Duffy, Riebe, Lingle, and Seifert. Lodging for 2 US students are not being requested from FSPT. Unit price: 17 €/person/day, total number of days: 28.

D) Vehicle Rental. We will use two vans during the season to travel to the site and back from our base in Vésztő. Unit price: 75 €/van/day, total number of days: 30. Gas is also requested. Unit price: 400 €/van/season.

SCHEDULE

In Season 2023, field work will occur between July 3 and July 31, with breaks on Sundays.

Date (2023)	Tasks
7/2	Participants arrive in Vésztő
7/3	 Discussion of project plans Equipment transport from the City Gallery, Vésztő Installation of pulley system
7/4 – 7/29	 Download and evaluation of data collected by the dataloggers and soil probes Completion of conservation interventions in the northern and central sections (Areas B, D, F, H, I, J, K, N, O) Sample collection (micromorphology, radiocarbon, sediment) Mudbrick production and application of geotextile and sacrificial layers on selected profiles Cleaning and conservation of exposed features and displayed objects in the northern and central sections Completion of shelter rehabilitation plan Visit of and discussion with potential exhibition designers
7/30 - 7/31	 Preparation of documentation Discussion of project results Dataloggers and soil probes – Retrieval of data collected during the field season, off-season data collection program initialization Equipment transport to the City Gallery, Vésztő Deinstallation of pulley system Photogrammetry modelling Completion of documentation
8/1	Participants leave Vésztő

FIGURES



Figure 1. Map of Hungary with Vésztő-Mágor marked with red circle



Figure 2. Aerial photo of the Vésztő-Mágor tell



Figure 3. The Vésztő-Mágor tell with excavation trenches from the 1960s to 1980s. The *in situ* exhibition is located in the '1986' trench. After Hegedűs and Makkay 1987: Figure 1.



Figure 4. The entrance of the shelter to the *in situ* exhibition


Figure 5. The *in situ* exhibition viewing from the south. Photo taken in 2014.



Figure 6. The in situ trench at Vésztő-Mágor with letter designations indicating profiles and platforms



Figure 7. Cutting back of Area C



Figure 8. Closing photograph of Areas A and C



Figure 9. Construction of a sacrificial support structure in Areas B and I



Figure 10. Closing photograph of Areas A and C



Figure 11. Installation of the soil probes



Figure 12. Structural sondage of the shelter



Figure 13. Photogrammetric model of the *in situ* trench taken at the end of Season 2022

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FOUNDATION FOR THE **STUDY** AND **PRESERVATION** OF **TELLS** IN THE PREHISTORIC OLD WORLD

Neuffenstraße 57 · D-73734 Esslingen am Neckar

Dr. Attila Gyucha Department of Anthropology University of Georgia Baldwin Hall, Office #253A 355 S. Jackson St. Athens, GA 30602 United States of America

14.01.2023

Subject: Time Will Tell: The Vésztő-Mágor Conservation and Exhibition Program

Dear Dr. Gyucha,

following the recent meeting of our boards, I would like to let you know that your proposal 'Time Will Tell: The Vésztő-Mágor Conservation and Exhibition Program' has found unanimous approval regarding the aims and the quality of your work proposed and your project's match with the purpose of the foundation's statutes. We also wish to congratulate you on the work done in 2022! However, our advisory board has also expressed concerns about the targeted duration and the project scope, which are considered problematic as they may exceed the foundation's possibilities alone.

We are pleased, nonetheless, to inform you that the foundation is ready to support your work in 2023 with funds amounting to **10.000** Euro for expenses as stated in your application and budget calculation.

Funding is subject to your written acceptance of our funding guidelines and general information for applicants attached to this letter. Please note, in particular, our invoicing regulations, and that we require receipts for all travel and material expenses *etc*. granted.

A final report and settlement on your work is to be submitted at the latest six weeks after expiry of the funding period, *i.e.* by February 2024.

Although we have taken note that your project is scheduled to be multi-annual, we kindly ask you to submit a follow-up application in case you should seek our support beyond the current funding period.

In our assessment of such a re-application we will certainly take the positive evaluation of your first two proposals into consideration. However, please do note that, at this point, for legal and fiscal reasons we cannot commit ourselves to funding the continuation of those projects that will be supported in 2023, since our funding activity will depend on the means available and the applications that we receive. So please make sure to also be in touch with other funding agencies and to inquire alternative options for ensuring the continuity of your work.

Should you have any questions please do not hesitate to get in touch.

We wish you every success in your work on this project and remain with best regards, yours sincerely,

Till

Prof. Dr. Tobias L. Kienlin (Chairman)

Attachment: Funding Guidelines and General Information for Applicants (2023 version)

FINAL REPORT ON SEASON 2023 OF THE VÉSZTŐ-MÁGOR CONSERVATION AND EXHIBITION PROGRAM

VÉSZTŐ-MÁGOR, HUNGARY

INTRODUCTION

The Körös Consortium, established by four international archaeological projects that conduct archaeological research in the Körös region of Southeast Hungary, and conservation specialists from the UK launched the *Vésztő-Mágor Conservation and Exhibition Program* (henceforth, Program) in 2021 to conserve, preserve, and rejuvenate the exhibition in an *in situ*, shelter-covered trench at the tell site of Vésztő-Mágor. In the implementation of the multi-year program, we closely cooperate with the Vésztő-Mágor National Historical Park (henceforth, Park), the Municipality of Vésztő, and the Munkácsy Mihály Museum in Békéscsaba.

Vésztő-Mágor is the largest tell in Hungary (Figure 1). The site incorporates two mounds that constituted a single tell in prehistory. Several excavations were conducted on the tell in the 1960s and 1970s to explore the Neolithic, Copper Age, and Bronze Age development of the site and to recover the Medieval Age monastery located on the southern mound. In 1986, a 19x4.5-m trench was opened in the northern mound's central part, which was later covered with a permanent structure to attract visitors (Figure 2). This unique sheltered trench is the subject of the Program.

Because the exposed profiles have dried out, crumbled, and even collapsed in many areas throughout the *in situ* trench since 1986, conservation efforts were implemented about 15 years ago, during which the Park applied clay renders on a plastic mesh on several profiles throughout the trench. This method was unsuccessful, and, in many cases, the renders detached and further destroyed the profiles. We initiated the Program to mitigate further deterioration and save the trench for the Park and the local community, as well as to develop best practice guidelines to preserve and present exposed trenches at other tell sites in Southeast Europe and beyond. Following a preliminary site survey and the installation of environmental dataloggers (see below) in November 2021, the first field season of the Program took place in July 2022, with a focus of our efforts on the heavily eroding northern third of the *in situ* trench (see the final FSPT report from 2022). During Season 2022, for documentation purposes, a letter designation was assigned to each profile and platform exposed over the course of the 1986 excavation (Figure 3).

In 2023, the Program's field season took place from July 3 to August 1, and we continued working on the most deteriorated, northern section of the trench as well as advanced toward the central area. More than half of the season's expenses were covered by the Foundation for the Study and Preservation of Tells in the Prehistoric Old World (henceforth, FSPT). In addition, the Willson Center for Humanities at the University of Georgia granted USD7000, and the Municipality of Vésztő, the Christian-Albrechts-Universität zu Kiel, the Cardiff University, and the University of York also contributed to the expenses.

Below, we summarize the various conservation and archaeological approaches, methods, and results from Season 2023, as well as our planned activities in Season 2024.

CONSERVATION INTERVENTION WORK

Initial work

At the beginning of Season 2023, supplies were purchased and site infrastructure (ladders, sandbags, scaffolding) was installed to allow for safe movement throughout the trench.

Environmental data was retrieved from the seven TinyTag TGP 4500 Plus 2 Temperature and Relative Humidity dataloggers. The analysis of the data collected between Seasons 2022 and 2023 suggests that issues with dew point occurring throughout the trench continue to be a prominent feature. As documented in the previous year, there are distinct microclimates transversing the varying levels. The northern area of the trench, which is furthest away from the door, comparatively performed the best regarding minimal periods of condensation. The lower areas of the trench have the highest frequencies of condensation.

The site condition survey prior to fieldwork indicated that Profiles H and K featured fresh collapse, with other areas showing signs of erosion. Bird droppings were found on the trench floor underneath the two rear vents that were cleaned out in 2022 (above Platforms D and E; see Figure 3), and drip lines were observed under all four vents. Heavy rains also resulted in water coming through the vents and into the shelter above Platforms D, E, L, and M. These areas were cleaned of refuse, and the Municipality of Vésztő was consulted and agreed to repair the external structures of the vents to mitigate these issues (see below).

Moveable artifacts were removed from display to ensure their safety during excavation and conservation work. These were replaced once our work was completed in the shelter.

In addition, an Artec Ray 3D laser site scanner was brought to the site this year to document its current condition and any changes made during the season (Figure 4). The scanner features submillimeter accuracy, producing a highly detailed point-cloud map. This allows us to quantify material loss from season to season and understand deterioration rates of any applied treatments. Scans can also be incorporated into the visitor experience (augmented and virtual realities), once the project has reached the exhibition phase. Areas with planned excavation works, including Platform E, and Profiles F, J, and K (see Figure 3), were prioritized for scanning to capture their condition before any digging began. These areas were then scanned following excavations but prior to conservation. The entire site was then scanned once all works were completed and the trench was cleaned.

Major Conservation Interventive Works

Based on our experiences obtained last year, four principal preservation and conservation approaches and methods were used during Season 2023: 1) cutting back profiles featured by better retention; 2) constructing sacrificial support structures in heavily eroding profile sections; 3) protecting platforms to prevent erosion; and 4) applying grouting, composed of acrylic resin, perlite, and screen trench soil, to counteract sheering in areas at risk of collapse.

Profiles F, J, and K continued to deteriorate in the off-season and were identified as being at severe risk of loss. Project staff determined that render walls constructed of mudbrick were the most appropriate treatment to mitigate further deterioration in these areas. The number of mudbricks required for these areas necessitated large-scale production. During Season 2023, we managed to largely mechanize mudbrick production by introducing a lawn mower to quickly produce chaff of fine particle size and a cement mixer to process mud for brick and mortar; similar to last year, we exclusively used excavated soil from the tell to produce about 2,000 mudbricks (Figure 5).

As a result of extremely poor retention, Profile F, and with that the western section of Platform E, was cut back to a large extent during the season. In addition, to a much smaller extent, the northern part of Profile J, and with that the southern section of Platform E, and Profile K also were cut back. Following the completion of excavation works and associated site documentation, sacrificial support structures were installed across the entirety of Profile F (Figure 6). The render

wall shoring Profile K was constructed using also wooden dowels to ensure it leaned into the profile (Figure 7). The brick facade extends up to the hiatus layer between the Copper and Bronze Ages (see below), but below the plowzone. The sacrificial support structures will be grated into a single context in 2024 to visually obscure the brick coursing.

During Season 2023, we repaired the render wall on Profiles B and I that had slightly pulled away from the profile since the end of Season 2022. Repairment occurred through the application of a rammed earth construction and mortar made of screened site spoil, chaff, and perlite to fill gaps. The remainder of Profiles B and I was finished with an industrial grater to produce a smoother finish of the surface.

Geotextile was laid across Platforms E and D to mitigate erosion due to moisture loss. Screened soil was spread across the geotextile for both moisture retention and visual congruity.

A cracking detected in Season 2022 through Platform AA had continued to worsen in the off-season. A grouting mixture was used to fill the gap. Further to this, the skeletal remains and artifacts on the platform were cleaned. The two micromorphology samples taken in 2014 in Profile BB were filled with geotextile, mudbricks, and earthen mortar, to limit these areas from continuing to preferentially deteriorate (Figure 8).

Additional conservation and documentation activities

A large, Bronze Age urn excavated from Profile F in Season 2023 is undergoing conservation work and will be completed in Season 2024. The base has been reconstructed, with the upper section refitting and in-painting to be completed so the vessel can be put back on display in the trench. The original impression has been left from where the vessel was excavated, so it will be well-supported once it goes on display.

Additionally, Pazirik Ltd. performed the photogrammetric modeling (https://sketchfab.com/3d-models/veszto-feltaras-20231214-

<u>8b5ae09e08004297ac239ec1f9dfa074</u>; see also Figure 9), as well as a virtual tour of the trench in December (http://virtualisturak.pazirikkft.hu/virtualistura/veszto_asatas/).

ARCHAEOLOGICAL WORK

Overview

Although conservation in the *in situ* trench takes first priority during the Program, we consider a research-based approach and the systematic collection of archaeological information to be vital. Excavation goals in Season 2023 included 1) collecting data on the Neolithic, Copper Age, and Bronze Age use history; 2) retrieving artifacts and ecofacts from excavated profiles; 3) taking samples for further studies (such as charcoal for ¹⁴C dating, sediment, and flotation).

Excavations in the *in situ* trench were conducted in Season 2023 in Profile F, and with that the western section of Platform E, the northern section of Profile J, and with that the southern section of Platform E, as well as Profile K. In sum, the excavation of Profile F exposed Bronze Age house floors and thermal features, the occupational hiatus between the Bronze and Copper Ages, the uppermost Copper Age deposits (Figure 10), whereas Profiles J and K included these levels, as well as Neolithic layers (Figures 11 to 14). The extent of Copper Age and Neolithic layers systematically investigated was less than the exposed Bronze Age layers in Seasons 2022 and 2023, but their content and composition differences were still notable.

Methods

In Season 2023, we worked in the northern and central sections of the *in situ* trench. Excavation Unit (EUs) numbers were assigned initially for large areas where failing renders (e.g., see Figure 11) were removed and later for more precise identifications of layers. Lot numbers were assigned to EUs to subdivide space further and allow us to process artifacts while EUs remained open. EUs often served as somewhat arbitrary contexts with lots within parsing the internal stratigraphy and depositional history, including multiple layers or different features observed during excavation.

Samples, including charcoal, sediment, micromorphological, and flotation samples (Figure 15), were given unique identifier numbers and shot in with a total station. All areas were mapped or sketched, and completed EUs were photographed as work proceeded.

Excavation target depths in the profiles varied according to area, from less than 5 cm in some sections of Profile K to over 40 cm in some sections of Profile J. Last year, we parsed the vertical stratigraphy visible in the Bronze Age components of the profiles into five stratigraphic groups (BA1-5), each of which contained multiple distinct deposits. This year, we employed a similar approach, recovering Copper Age layers as CA1 and CA2 and Neolithic layers as N1 to N3.

Structures and other features

Overall, the season's archaeological efforts continued to reveal further details of Bronze Age architectural features. Only a few BA4 and BA5 features were excavated last year, but more were uncovered in Season 2023. Several floors from Neolithic and especially Copper Age layers also were exposed.

In the N1 layer, in Profile K, a daub and charcoal layer was exposed with Late Neolithic cultural material, but no apparent features or house floors were identified. In N2, a charcoal-rich layer was documented in Profiles J and K. In the N1 layer, clear feature outlines or house floors were not found, but some potential thermal features were observed in Profiles J and K (see Figure 14). The recovered finds from the Late Neolithic layers represent the Tisza culture.

A hiatus layer of ca. 10 cm in thickness between the Neolithic and Copper Age (H1) was excavated in Profiles J and K. All the recovered cultural material looks Neolithic, and compared to the hiatus layer between the Copper Age and Bronze Age (H2), the concentration of archaeological finds is much lower in H1.

The CA2 layer, excavated in Profiles J and K, is about 30 cm thick and contains a series of white clay, unburned floors. The deposits were overall pretty clean with a moderate amount of artifacts. The break between CA1 and CA2 was very similar to the distinction the KRAP project identified in 2014 in the southeastern trench profile. We excavated the CA1 layer in Profiles F, J, and K (see Figure 14). The recovered ceramic finds from the Copper Age layers represent the Tiszapolgár culture, with sherds showing Bodrogkeresztúr-like stylistic elements. Bronze Age intrusive deposits in the CA1 layer included a whole cup.

Excavated in Profiles F, J, and K in Season 2023, H2, the occupational hiatus previously identified in trenches exposed in the 70s, seems to be an Early Copper Age deposit and is rich with animal bones and Tiszapolgár ceramics. It appears to be a hiatus only with respect to observable archeological features. It is a very different sort of deposition than the layers below and above and is vertically consistent throughout. A single, very concentrated layer of animal bones was recovered in the lower third of this deposit that may not have originated from a discrete event but rather can be associated with a palimpsest of depositional events (Figure 16).

The BA5 layer is the clearest BA deposit, on top of H2, and it includes a thin (ca. 3-4 cm) white clay floor with charcoal, which was visible last year in Profile B. In Season 2023, during the

excavation of Profile F, about 1-1.5 m across from Profile B, more of BA5 layer was excavated, together with BA4 layer. This white clay floor, ash, and charcoal does not have a clear matting like other floors in the Bronze Age layers.

Concerning the BA4 layer, in 2022, in addition to a primarily sterile grey fill layer, a plastered house floor was found, the length of which (ca. 6.25 m from north to south), is repeated through BA3 and BA2, suggesting several house floor renewals in a structure that was repeatedly re-used. This year, in Profile F, into Platform E, we exposed this same deposit that may be interpreted as a redeposited fill layer for floor plastering on top. Last year, the top of BA4 presented a level of charred grains 2.5 m to the south in Profile B, but this was not visible in the deposits we excavated into Profile F in Season 2023. On top of BA4A was another white deposit and this had a clear structure of matting, reduced to a phytolith layer related to a house floor (Figure 17).

In 2023, we also continued the exposure of the B3 layer. Like BA4, these deposits were also found along the western (Profiles B and I) and northern (Profile A) profiles last year. Similar to BA4, it contains a floor fill on the bottom and a white plastered floor in the middle, and in Profile F/Platform E, this deposit has a charred grain deposit on top. The charred cereal layer component of BA3 can be followed into the west wall to the viewing platform and along Profile F about 1.5 m south to the northern profile. This seed layer disappeared at the architectural break between the north and south axis of this area, where a large urn was excavated while cutting back Profile F in Season 2023 (Figure 18). Excavation of BA3 deposits continued in 2023 in Profile K as well. We didn't dig as far into the eastern profile this season as we did in 2022, as the dryness of Profile K and its large divots from collapse had us excavating less than we expected. The deposits were also very dry and had numerous intrusive features, such as animal burrows and/or postholes, extending higher up than BA2.

Regarding BA2, the black reduced layer observed last year in Profile C extends into Profile K excavated this year, and has charred textiles of some kind, and a phytolith layer that extends back into Profile C. The deposit is stratigraphically lower than the textile sampled and studied last year (see below), however, with ca. 15-20 cm between them. Here, we exposed renewed house floors visible to the north and west.

Ceramics recovered from all the Bronze Age layers primarily represent the Ottomány style.

Finally, the latest set of features is medieval or modern pits originating just underneath the plowzone.

SHELTER REHABILITATION AND EXHIBITION REJUVENATION

In order to achieve and maintain a stable environment in the *in situ* trench, the shelter's condition is a key component. Although, as a condition survey performed in 2022 indicated, the shelter is in a good overall structural condition, rehabilitation works to mitigate some issues and remodel the structure to sustain constant environmental conditions are inevitable for the success of the Program.

From Season 2022, we have been working with a local structural engineering company (Construct Plan Ltd.) to assess the shelter's current condition and determine improvements that would enable constant environmental conditions to be maintained in the *in situ* trench. In 2023, consultations concerning the details of shelter rehabilitation in Phase II of the Program commenced based on Construct Plan Ltd.'s assessments and our currently available environmental data, and a quote for compiling the construction design documentation was received. In addition, during Season 2023, in collaboration with the Municipality of Vésztő, the shelter vents were also repaired to protect the trench from water ingress and bird droppings.

We work with Pazirik Ltd., the most experienced in Hungary in creative museum exhibitions, including visual design, interactive multimedia, and mobile applications, to develop a state-of-the-art exhibition in the in situ trench. In December, representatives of the Park, the Program, Pazirik Ltd., and Construct Plan Ltd. held a kick-off meeting at the site to start discussing exhibition technical requirements to be included in the construction design documentation.

PUBLIC OUTREACH AND DISSEMINATION

We provided tours twice a week during the season for visitors and were interviewed by regional media (https://www.beol.hu/helyi-kozelet/2023/08/valyogteglat-is-keszitenek-hogy-megmentsek-a-latvanyszelvenyt-veszto-magoron; https://www.beol.hu/helyi-kozelet/2023/05/jaminatol-a-georgia-egyetemig-a-beol-podcast-vendege-dr-gyucha-attila). We also established an Instagram page to publish news associated with the Program (@koros_consortium). In addition, in 2023, we presented two papers on the results of Seasons 2022 and 2023 at the 29th Annual Meeting of the European Association of Archaeologists in Belfast and another one at the ICOM-CC 20th Triennial Conference in Valencia. Preliminary results of the conservation work are included in a paper accepted for publication in Journal of Field Archaeology, and another one, on the Bronze Age textile remain mentioned above, is under review for Antiquity Gallery.

In November, two posters were designed and printed to inform visitors about the Program; the FSPT logo will appear as the first credit line element (Figure 19). The QR code to the Program's Instagram page will be visible on the posters. Due to the remodeling works at the wine cellar, the posters will be placed along the viewing platform in February 2024.

PARTICIPANTS

The following participated in Season 2023 of the Program: Attila Gyucha (University of Georgia, project director), Paul R. Duffy (Christian-Albrechts-Universität zu Kiel, co-director), Ashley Lingle (University of York, co-director), Jerrod Seifert (Cardiff University, co-director), Danielle Riebe (University of Georgia, co-director), and William P. Ridge (University of Illinois at Chicago, co-director), as well as American, German, Hungarian, and British students.

ACTIVITIES PLANNED FOR SEASON 2024

The next field season will occur in July 2024. Our stabilization and conservation efforts will be directed to the northern, southern, and central sections of the *in situ* trench.

In the northern section, we will remove the old clay renders and cut back Profiles H and N, as well as the southern part of Profile J (see Figure 3). On Platforms G, L, and M, we will use geotextile for moisture retention and screened tell soil for visual congruity. In the southern section, we will focus on Profiles II, MM, and LL, located in the southeastern corner of the trench. Due to severe basal deterioration and friable sediment structure, some of these profiles might need to be strengthened by mudbrick support walls. In the central section of the trench, we will cut back Profiles Q and W. Due to the relatively good condition of this section, it is not expected that structural support will need to be implemented here. In smaller areas across the trench, we will pursue the application of a grouting mixture to rectify sheering subject to potential collapse. Additionally, the restoration of the large, Bronze Age ceramic urn recovered from Profile F in 2023 (see above) will be completed and the artifact will be returned to its original location in the trench.

Similar to past seasons, profile excavations will be carried out as a scientific archaeological investigation, and flotation, micromorphological, radiocarbon, and sediment samples will be taken for analyses. After the completion of our fieldwork, the recovered artifacts will be stored at the Munkácsy Mihály Museum in Békéscsaba and will be accessible to other scholars.

Throughout Season 2024, we will continue recording our interventions in the Conservation Database, and high-resolution 3D models will be produced using the Artec Ray 3D laser site scanner weekly to detect and quantify transformations in structural conditions. We also will review the data collected by the dataloggers and the soil probes after Season 2024. The multi-year data on micro-environmental trends across the trench will be utilized to determine the technical parameters of a temperature and moisture control system that will ensure optimal conditions for the preservation of the earthen architecture, features, and displayed artifacts in the *in situ* trench. The shelter construction design documentation, including the blueprint of a temperature, moisture, and air circulation control, as well as a monitoring system, operational steps, and related expenses, will be finalized upon the completion of the environmental analysis following the closure of Season 2024. In cooperation with the town of Vésztő and the Park, in Fall 2024, with the blueprint in hand, we will start compiling grant proposals to secure funds to remodel the shelter.

January 13, 2024

Juch ~

Dr. Attila Gyucha, PI Vésztő-Mágor Conservation and Exhibition Program

FIGURES



Figure 1. Aerial photo of the Vésztő-Mágor tell



Figure 2. The *in situ* trench at Vésztő-Mágor



Figure 3. The *in situ* trench at Vésztő-Mágor with letter designations indicating profiles and platforms



Figure 4. Artec Ray 3D laser site scanner at work in the trench at the beginning of Season 2023



Figure 5. Batches of drying mudbricks next to the tell in Season 2023



Figure 6. Construction of a sacrificial support structure along Profile F in Season 2023



Figure 7. Construction of a sacrificial support structure along Profile K in Season 2023



Figure 8. Closing photo of the northern and central sections of the trench at the end of Season 2023



Figure 9. Photogrammetric model focusing on the northern and central sections of the trench taken in December 2023



Figure 10. Profile F after excavation in Season 2023



Figure 11. Profile J before excavation in Season 2023, with a failing clay paster render installed ca. 15 years ago



Figure 12. Profile J during excavation in Season 2023



Figure 13. Profile K during excavation in Season 2023



Figure 14. Profile K after excavation in Season 2023



Figure 15. Taking a micromorphological sample in Profile K in Season 2023



Figure 16. Exposed layer of animal bones and other Early Copper Age finds in Hiatus 2 in Profile J in Season 2023



Figure 17. Excavation of a Bronze Age phytolith layer on a house floor in Profile F in Season 2023



Figure 18. Excavation of a Bronze Age urn in Profile K in Season 2023



Figure 19. Program information poster for visitors

Applicants

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Project

Title of project: Chronology, society and environment of the Neolithic tells in Pelagonia

Brief description of project (not more than 1200 characters):

This project is continuation of the same one that was initiated in 2022 and it will go more thoroughly into the designated directions of research thus involving geomagnetic scanning, geoarchaeological study, excavations, archaeobotanical analysis and finds documentation. Besides its previous focus on two Neolithic tells in Pelagonia (North Macedonia) in 2023 a new site will be integrated into research as it gives entirely new perspective into the first agricultural societies in the Balkans. In addition to its aims to achieve a more complete comparative data set from the two neighbouring and contemporary tells of Vrbjanska Čuka and Veluška Tumba, also the site of Vlaho will be considered, that is established around 6400/6300 cal BC on the mountain slopes next to valley with wetlands where most of the tells were dispersed 300/400 years later. The excavation and dating of Vlaho in 2022 gave entirely new perspective for the inhabitation of Pelagonia that is necessary to include in the study along with the tells of Vrbjanska Čuka and Veluška Tumba. Although these sites have tells features they belong in different environmental setting while the recent geomagnetic scanning indicated entirely different settlement organisation with Vlaho composed of even 13 circular ditches and one double ditched rectangular enclosure in the later phase. In 2022 these differences were further supported with the geoarchaeological, archaeozoological and archaeobotanical analysis along with the study of material culture and architecture that apparently demonstrates features unique to each of these three sites. Therefore it would be essential to further explore one of the earliest Neolithic sites in the Balkans in relationship with two other tells, particularly considering its potential destruction by announced coal mining on its territory. The continued research on these sites will bring to larger awareness of their significance and will contribute in their future protection.

Keywords: Neolithic, North Macedonia, tells, multidisciplinary research, protection

Funding Sought

Period of the grant: 12 months

Total costs: 20 000 euro

Other funding: project application at the Macedonian Ministry of Culture (if granted a maximum funding between 1500 and 2500 euro) and DAI (German Archaeological Institute) for dating the samples and archaeobotanical work.

Society, chronology and environment of the Neolithic tells in Pelagonia (SCENTIP)

The beginning of the Neolithic in the Balkan Peninsula has been one of the major focus of the prehistoric archaeology and therefore many perspectives were proposed (Perlès 2001; Reingruber 2011). Due to meticulous research the initial years of the establishment of the first agricultural communities were determined thus their advancement in this region was easily followed along with the introduction of agriculture, pottery, daub dwellings, figural representations, intramural burials etc. Nevertheless, there are few regions that were a sort of chronological gaps in regard to progression of the farming societies from Greece to the Central Balkans. One of them is Pelagonia, an elongated valley in the geographical Macedonia, bordering the North Macedonia and West Macedonia in Greece. Until the recent research it was considered as a region inhabited around 6000 BC that was much later than some of the neighbouring areas in Greece and Albania, such as the Paliampela, Mavropigi and Vashtemi sites established around 6500/6400 CalBC (Allen et al. 2013; Karamitrou Mentessidi et al. 2013; Kotsakis 2018). On the other hand, one of the earliest sites recorded was Amzabegovo with its chronological frame approximately around 6100 BC (Gimbutas 1976). Considering the dates of sites in Central Serbia around 6250 CalBC the entire region of North Macedonia was regarded as a chronological gap as the provided dates were much later than those in Greece, Albania and Serbia i.e. the route of Neolithization from West Anatolia to Central Europe.

But the recent dating of the site of Vlaho in the laboratories at the University of Seville and ETH University in Zurich indicated much earlier inhabitation of Pelagonia that it is in relation to the one in Western and Central Macedonia in Greece and Korca region in Albania (Naumov et al. *in print*). The earliest dates associated with Vlaho are approximately 6400/6300 CalBC that substantially fills the chronological gap and further defines the demographic route of the first farming societies in the Balkans. Besides its chronological potentials the site of Vlaho gives entirely new perspective of the Neolithization processes in the wetland areas, as well as absolutely novel setting of spatial organization in the Early Neolithic. Therefore this site will be used as a reference in this project in order to understand the environmental, social and symbolic processes of the agricultural communities that initially inhabited the region of Pelagonia.

Pelagonia is the biggest valley in North Macedonia surrounded by several high mountains (Fig. 1). The alluvial landscape created by the Crna Reka river and its tributaries, as well as the diversity of the natural landscape which also included mountain slopes, wetlands and forests, created an ideal resourcerich environment for the first farmers in the region. Recent research has demonstrated the rapid dispersal of Neolithic farmers in Pelagonia around 6000 BC that gradually established tells (Fig. 2) (Antolín et al. 2020; Naumov 2016a; Naumov 2020; Sanev 1994; Simoska and Sanev 1976). The initial research of Neolithic sites in Pelagonia between the 1950s and 1980s characterised the first farmers as a unified unit belonging to the same cultural group, called Velušina-Porodin, sharing identical building practices, pottery, human representations and tools (Kitanoski 1977; Kitanoski 1989; Kitanoski et al. 1990; Simoska and Kuzman1990; Simoska and Sanev 1975; Simoska and Sanev 1977; Simoska et al. 1979). Therefore, this project will also question the proposed local uniformity by comparing three key nearby tell settlements located in Pelagonia in terms of their building techniques and pottery production, their economic practices and their interaction with the environment. Studying the local diversity in Neolithic Pelagonia, as well as potential interaction between sites with different characteristics, is relevant and timely research that will add a missing piece to the overall understanding of the Neolithic tells in Southeast Europe.

Due to its complex nature and social dynamics, tells have been studied by several experts and they are an integral part of studies of settlement formation processes. The natural conditions in which they are created, demographic dynamics, architectural technologies, settlement strategies, economic characteristics of the population, their craftsmanship and ideology that have played a key part in the formation and continuity of these specific sites have been part of thorough research as well (Bailey 2002; Blanco Gonzales and Kienlin 2020; Evans 2005; Hofmann et al. 2012; Kotsakis 1999; Naumov 2016a; Perlès 1999; Rosenstock 2009). As a result of this extensive research, a variety of responses and interpretations have been offered that explain the tells very thoroughly and those that created and used them for living. However, such comprehensive study is mainly performed on tells in the Near East, Greece and Central Europe, while their research in the Balkans it is still modest. Considering the particular features of tells in Anatolia that can be also traced the Balkans and especially in Pelagonia, than a multidisciplinary research of these sites in the region is necessary and especially their mutual relationship. Therefore the SCENTIP project will be focused on three tells in different environmental setting, such as Vlaho that is on the mountain slopes, Veluška Tumba that is on the other side of the Pelagonia valley in vicinity of a vast wetlands and Vrbjanska Čuka, a tell in the northern outskirsts of this valley surrounded by smaller hills and in a way visually isolated from the tells in Central Pelagonia. Consequently the SCENTIP project will explore simmilar types of sites (tells) in diverse ecological ambients and further trace the simmilarities and differences in terms of spatial organization of the settlements, chronology, pottery production, figural representations, diet, tools implementation, natural setting, formation processes, farming economy and husbandry. This would be esential approach in order to understand how the Neolithic started in Pelahonia and whether or not these agricultural communities interacted among each other. Furthermore the impact of long distance networds will be studies as there are evident simmilarities with the Neolithic societies in the wetland regions of Ohrid, Prespa, Amindeon and Korca, a social an economic relationship that was maintained in the Chalcolithic and Brozne Age as well (Naumov 2016c).

Previous own research on the topic and goals of the project

The proposed project is the continuation of the previous one that has been started in 2022 and supported by the FSPT. It was not a surprise that the 2022 research provide entirely new data about the chronology, settlement organization, architecture, material culture, diet and environment that will significantly advance our knowledge on the beginning of the Neolithic in Pelagonia and in the Balkans in general (Naumov et al. *in print*; Naumov et al. *in prep*). However, this project is based on the research initiative that has been started in 2013 and with 2023 fieldwork will frame a decade of intensive study of prehistoric societies in Pelagonia. Since its initial start the study of Pelagonia was projected with a multidisciplinary and international team. The first phase of this research consisted of reconnaissance, geomagnetic prospection and small-scale excavations at several Neolithic tells (Naumov et al. 2014; Naumov and Tomaž 2015; Naumov and Stojkovski 2015; Naumov 2016a; Naumov 2016b; Naumov et al. 2017a; Naumov et al. 2017b). This was followed by a second phase with more extensive excavations and multidisciplinary research at three tell sites such as Vrbjanska Čuka, Veluška Tumba and, more recently, Vlaho (**Fig. 3**) (Naumov et al. 2016; Naumov et al. 2017a; Naumov et al. 2018c; Naumov et al. 2016; Naumov et al. 2017a; Naumov et al. 2018c; Naumov et al. 2016; Naumov et al. 2017a; Naumov et al. 2018c; Naumov et al. 2016; Naumov et al. 2017a; Naumov et al. 2018c; Naumov et al. 2016; Naumov et al. 2017a; Naumov et al. 2018c; Naumov et al. 2016; Naumov et al. 2017a; Naumov et al. 2018c; Naumov et al. 2018c; Naumov et al. 2020; Naumov et al. 2021a; Naumov et al. 2021b; Naumov et al. 2020; Naumov et al. *in print;* Naumov et al. 2021a; Naumov et al. 2021b; Naumov et al. *in print;* Naumov et al. 2021a; Naumov et al. 2021b; Naumov et al. *in print;* Naumov et al. 2021a; Naumov et al. 2021b; Naumov et al. *in print;* Naumov et al. 2021a; Naumov et al. 2021b; Naumov et al. *in print;* Naumov et al. 2021a; Naumov e

prep). This new research program aimed to expand previously excavated areas, reanalyse their stratigraphy and revise the architecture and material culture.

At Vrbjanska Čuka tell, an area of 400 m² next to the trench opened in the 1980s has been excavated since 2016, uncovering more than 1 meter of Neolithic deposits and up to 7 construction phases (**Fig. 4**). At Veluška Tumba tell the research was initiated in 2017. The old trench was reopened, the profile section was reanalysed and a full sample sequence was obtained for environmental analyses (**Fig. 5**). Additionally, a smaller area within the trench was dug deeper, uncovering new building phases close to the base of the tell, thus confirming almost 4 meters of Neolithic stratigraphy and 12 construction phases. The research of Vlaho started with prospection in 2020 that was followed by excavation of smaller test trenches in the northern, eastern and western periphery of the site. Due to excellent preservation of the surface material from Early Neolithic and the abundance of synchronous architectural layers it was decided to perform a geomagnetic scanning of the site and to open larger trench in its southern part (**Fig. 6**). The scanning demonstrated the astonishing presence of 13 circular ditches and a double perpendicular enclosure at later stage while the excavation indicated presence of seven architectural phases with uncommon structural features for Pelagonia.

In regard to the multidisciplinary approach in the research of these three sites, for the first time, archaeological scientific methods in the study of botanical and animal remains, radiocarbon, use-wear and lipid residue analyses are being systematically applied. The results obtained so far demonstrate that excellent preservation prevails at all sites (Antolín et al. 2020; Beneš et al. 2018; Jovanović et al. 2021; Mazzucco et al. 2022; Naumov et al. 2021a; Stojanovski et al. 2020).

The recent research on Vlaho, Vrbjanska Čuka and Veluška Tumba demonstrates that these Early Neolithic sites, although located relatively near from each other (30-40 km), feature important differences in settlement organization, architecture and material culture (see summary in *Table I*), that will be further examined within SCENTIP project. Moreover, the latest information from the radiocarbon dating indicates that Vlaho was established at 6400/6300 CalBC i.e. 300/400 years before Vrbjanska Čuka and Veluška Tumba that gives absolutely new perspective on how these tells functioned and whether or not were interacting among each other. Similarities were also observed, for instance in the archaeobotanical assemblages, but only when comparing the data from both sites as a whole, and it is expected that interesting shifts can be observed at an intra-site level that allow to

compare economic dynamics at both sites with a higher chronological resolution (**Fig. 7**). The same is true of other food resources, as the archaeozoological analyses performed at Vlaho indicated entirely different treatment of animal bones than that in Vrbjanska Čuka and Veluška Tumba.

The remarkable initial results coming out from intensive multidisciplinary research of these tells, provide a better perspective, but also brought in front more questions that aim to understand socioenvironmental dynamics at both sites and their chronological evolution (*Table I*, **Fig. 8** and **Fig. 9**). A holistic and systematic comparison is, however, at the moment prevented by the uneven state of research of these three sites (*Table II*). This proposal intends to collect the missing data through multidisciplinary research with the following research goals (RG):

- RG.1. Defining the architecture (their size, positions and internal structures) and revealing the spatial organization of the settlements by employment of geomagnetic scanning and by the excavation of larger areas.
- RG.2. Determining the chronology of construction phases with a sequenced radiocarbon dating program and implementation of Bayesian modeling.
- RG.3. Characterising the features of the material culture (pottery, figurines and tools) in each phase from the beginning until the end of the settlement.
- RG.4. Reassessing diet, economy and land use practices at a high chronological resolution with archaeobotanical and archaeozoological analyses.
- RG.5. Examining the relationship between the settlements and their environment through a targeted coring for sedimentological and palaeoenvironmental proxy analysis.
- RG.6. Studying the establishment of farming tell societies and their networks by and comparing three case studies in Pelagonia.

Research plan

In order to provide thorough elaboration to the designated research goals it will be fundamental to observe in detail the three tells through a well-structured research plan that is divided into several tasks (T) and working packages (WP). The tasks in relation to the above-mentioned goals would be:

T1 (related to RG.1): total geomagnetic scanning of Vlaho site and the surrounding of Vrbjanska Čuka and Veluška Tumba tells, as well as the excavation of Early Neolithic deposits in larger trenches.

T2 (related to RG.1): recording and measuring of the architectural remains and their comparison with the results from geomagnetic scanning (T 1) including the internal clay structures as well.

T3 (related to RG.2): radiocarbon dates of cereal grains from each construction episode at each site to have detailed chronological sequences of all three sites.

T4 (related to RG.4): analysis of seed, fruit and charcoal remains as well as faunal remains of each construction episode.

T5 (related to RG.3): documentation and study of pottery, figurines, house models and tools from Vlaho, Vrbjanska Čuka and Veluška Tumba recorded in each Neolithic stratigraphic unit.

T6 (related to RG.5): geoarchaeological coring in the broader area out of the tells to understand the geological processes, as well as the aspects of land use and land cover (including the presence of Neolithic wetlands and raw material for buildings and pottery).

T7 (related to RG.6): integration of data and comparison of both sites.

T8 (related to RG.6): publication of results in their presentation at the conferences and lectures.

The research tasks are organized into three work packages (WP). Overall coordination of the project lays with G. Naumov and F. Antolín, including also the coordination of fieldwork, lab analysis and of the dissemination of project results. In addition, various specialists will contribute to the project. Table II states what team members are responsible for which work components.

WP1: Fieldwork

Geomagnetic scanning and excavation: the initial provision of project data will be obtained from the geomagnetic scanning and excavation of Vlaho, Vrbjanska Čuka and Veluška Tumba. Geomagnetic scanning will be essential part of the research as this survey is not complete at Vlaho, while at Vrbjanska Čuka and Veluška Tumba only the tells, but not the surrounding, were examined (**Fig. 10**). Results from the geomagnetics will provide a spatial context for the excavated remains that can be further compared among these three sites. The digging of trenches in Vlaho is positioned in the southern part, but as the geomagnetic scanning indicates, this was a dynamic area of social activities in this Neolithic settlement. In Vrbjanska Čuka and Veluška Tumba the trenches are in central parts of the tells where the focus is on the architectural features and their interior in various stratigraphic layers, as well on sampling for the radiocarbon, geoarchaeological and archaeobotanical analyses (**Fig. 11 and**

Fig. 12). The detected buildings, various exterior contexts, material culture and trench in general will be documented with Harris Matrix, orthophotography, photogrammetric modelling and later processed into 3D images and reconstructions.

Geoarchaeology: in order to understand the landscape and geological processes in the vicinity of settlements a micromorphological sampling and coring in various areas in their surrounding will be performed as well (**Fig. 13**). This method will demonstrate whether the environmental setting and will elaborate the natural processes that were affecting the settlements and their surroundings.

WP2: Labwork

Study of the archaeological finds: Detailed study of architecture, pottery, house models and figurines, clay, bone and stone tools and flints. This will include studying their typology, production techniques and use wear.

Radiocarbon dating: During the previous research the dating of these three tells was performed that allow a first temporal characterization, but they are insufficient for a high-resolution chronology of all construction episodes (**Fig. 14**). Samples from various contexts including those that most likely date the beginning and end of each construction phase will be sent to the ETH in Zurich, where advantageous prices and turnaround time have been offered to the project. This will also include samples of botanic remains enclosed in daub, which can provide direct dates for house construction. A systematic and comprehensive dating programme will allow the application of Bayesian modelling in order to provide a detailed chronological sequence and eventual temporal phases in the settlements, which will be the basis for the direct comparison between both sites.

Archaeobotany: Flotation samples from the recent campaigns together with newly acquired samples will be analysed by A. Sabanov (and integrated in her PhD dissertation) and F. Antolín with the goal of establishing the main cultivars at each settlement phase and crop husbandry practices, as well as wild plant gathering activities. The wash-over technique will be used for the optimal recovery of plant remains. R. Soteras (DAI) will be employed for this task during fieldwork and for photographic recording at the lab. SEM and digital photography will be performed at the DAI. Charcoal analyses will be done by R. Piqué in order to provide palaeoecological and land-use information on woodland management.

Zooarchaeology: there is an archaeobotanical analysis performed at Vrbjanska Čuka and Vlaho that indicates apparent differences in diet and treatment of the animal bones. Therefore the study of animal remains from buildings' interiors and open areas will be performed during fieldwork and in the lab.

Anthropology: so far there are no Neolithic human remains recorded during the excavation of the sites. However there are indications that they can be found in peripheral parts of the sites and therefore the anthropological analysis will be necessary. This will provide information about ritual practices, but also AMS dating and isotope analysis of teeth and bones will contribute to the chronological frame of the settlement and to tracing the diet of its inhabitants.

WP3: Integration of data, outcomes and dissemination

As there will be an abundancy and diversity of archaeological material and records regular on-line meeting will be performed. Each field of research will compose the temporal dynamics observed at the tells and define phases intra-site and comparisons between these three sites. Discussions will allow to integrate different lines of evidence into a complex network that will define for each settlement phase which aspects remain constant, each change and how they relate between the three tells. A relational database will be built in collaboration with the IT department at the German Archaeological Institute. At the end of the project, all data will be integrated into the iDAI.field repository for sustainable storage as open access data.

<u>Publications</u>: The results from the 2022 research within SCENTIP project are published, in print and in preparation for the journals such as Antiquity-Project Gallery, Documenta Praehistorica, Patrimonium and the Journal of the Museum of Bitola (Naumov and Gulevska 2021; Naumov et al. *in print;* Naumov et al. *in prep*). Specific results from the project are also planned to be published in high ranking peer reviewed journals (such as *Journal of Archaeological Science* and *PLOS ONE*) to increase the visibility of the project. A complete publication of results will be achieved through a monograph to be prepared at the end of the project. Through the duration of the project, the results will be presented and therefore published in conference proceedings as well.
Impact and training in the context of Macedonian and Southeast European archaeology: It is an important aim of this project to raise awareness within the Macedonian archaeology community for the necessity of multidisciplinary collaboration between international scholars in the provision of substantial data for understanding the Neolithic tell societies. By communicating project results through various channels and especially by involving young Macedonian, Swiss and German students, this project will foster methodological training and international networks within the next generation of archaeologists.

Protection and presentation of the sites: The site of Vlaho is under serious threat of being damaged and mostl likely destroyed by the national initiative to make coal mine in its vicinity. Therefore the excavation of the site and the popularisation of the research outcomes will provide better awareness of the earliest Neolithic site in North Macedonia and one of the most specific prehistoric settlements in Europe regarding its enclosure features. Vlaho as well as Vrbjanska Čuka and Veluška Tumba are always protected after each archaeological fieldwork season, so the architectural remains and the trenches in general are covered with plastic and soil above them. The research team is also in conversation with sponsors and national institutions for funding to build roofs over the trenches at Vrbjanska Čuka and install boards. Importantly, the project will also engage the local communities living in the vicinity of the tells to raise awareness of the significance of the sites as local, Macedonian and international heritage.

Public outreach: As the team has done events on the tells in recent years, at the end of each forthcoming fieldwork season there will be a concert in the archaeological trench and a public lecture for the local community in the museums. This will cardinally help in the permanent preservation of these tells and their affirmation by the people living next to them. Throughout the duration of the project, the research team will also communicate intermediate results to the public via press conferences, interviews and public lectures. Currently a documentary on Vrbjanska Čuka is in its final stages. It is produced with the Macedonian National Television and will be locally broadcasted, but also presented on international festivals of archaeological documentaries. The final stage of the project will be an exhibition and a conference that will be organized in few years from now in the National Museum of North Macedonia. G. Naumov is employed at and organizes events in this museum. The international conference will be focused on the latest knowledge on the Neolithic tells in the Balkans where also the results from research on Vlaho, Vrbjanska Čuka and Veluška Tumba will be presented.

In regard to project awareness and dissemination of research results, a website will be developed as well. Vrbjanska Čuka already has a website (<u>www.vrbjanska.cip-cpr.org</u>) that will be continuously uploaded with recent data, and for Vlaho and Veluška Tumba new websites will be launched which will also promote the project outcome and its funding.

Risk assessment

The PIs and team have previously collaborated at Vlaho, Vrbjanska Čuka and Veluška Tumba. Therefore, this project builds on existing successful collaborations, but also consolidates and expands existing research networks. A number of essential collaborators from the museums of Bitola and Prilep have been involved in the excavation, finds study and conservation at both tells and will continue to be collaborators during this next phase of the research. Having a local team and students involved in the excavations is an essential asset to secure the successful field operations. In the eventual case that collaborators cannot travel to North Macedonia, permits will be requested in order to export samples so that the material can be studied abroad.

In order to launch the excavation, an official permit from the Directorate for Cultural Heritage Protection will be requested as a prerequisite for fieldwork on the Macedonian archaeological sites. During the excavation, the international and Macedonian laws for cultural heritage will be considered, so that the unearthed finds will be stored in the Museum of Prilep and the Museum of Bitola, and an export permit for samples analyzed in Germany, Serbia and Switzerland will be requested from the Directorate for Cultural Heritage Protection. The same procedures were performed in the previous international collaborations in Pelagonia and all permits were provided. Also, the agreements for the international collaboration were signed during the previous projects in Pelagonia that indicate a well established formal and fruitful cooperation. The agreements are also signed for the future research of these tells in the future and they are provided along with the other documents of this application. The thoroughly established scientific network will continue with the forthcoming SCENTIP project and the same procedures will be applied at various stages of the research.

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Fig. 1. Map of Pelagonia and its position in Macedonia and Southeast Europe with location of Vrbjanska Čuka and Veluška Tumba sites

(Map: Goce Naumov and Gjore Milevski)



Fig. 2. Map of Central Pelagonia and the density of Neolithic tells in the vicinity of wetlands (Map: Dragica Simoska and Goce Naumov)



Fig. 3. View on Veluška Tumba (a) and Vrbjanska Čuka (b) tells

(Photo: Goce Naumov)



Fig. 4. View on Vrbjanska Čuka trench

(Photo: Goce Naumov and Hristijan Talevski)



Fig. 5. View on Veluška Tumba trench

(Photo: Goce Naumov and Dimitar Bezanovski)





Fig. 6. View on Vlaho site and the results from

geomagnetic scanning (Photo: Goce Naumov,

Marcin Przybila and Dimitar Bezanovski)



Fig. 7. Proportions among the main cereal crops found at both case studies in Pelagonia

(Authors: Ferran Antolin and Amalia Sabanov)



Fig. 8. Archaeological finds from Vrbjanska Čuka (Photos: Goce Naumov and Aleksandar Mitkoski)



Fig. 9. Archaeological finds from Veluška Tumba

(Photo: Vlado Kiprijanovski)



Fig. 10. Proposed area for geomagntic scanning at Vlago

(Photo: Goce Naumov and Marcin Przybila)







Vrbjanska Čuka (a) and Veluška Tumba (b) (Photo: Goce Naumov)



Fig. 11. Areas planned for excavation in Vlaho

(Photo: Goce Naumov)



Fig. 13. Areas planned for geoarchaeological coring (indicated with rectangular red stripes) at Vlaho

(Photo: Goce Naumov)



Fig. 14. Radiocarbon dates for Vrbjanska Čuka (a) and Veluška Tumba (b)

(Calibration: Goce Naumov)





(Calibration: Goce Naumov)

Table I. The similarities and differences between the three tells	VRBJANSKA ČUKA	VELUŠKA TUMBA	VLAHO
Chronology	6000 - 5700 CalBC	6000 - 5600 CalBC	6400 - 6000 CalBC
Height	4 m (total) 2 m (natural bulk) 1.10 m (Neolithic)/0.9m LA/MA	6 m (total) 2.15 m (natural bulk) 3.83 m (Neolithic)/no later occ.	2, 40 m (total) 2.40 m (Neolithic)/no later sandstone foundation
Settlement	Circular Enclosed with ditch Buildings oriented NW-SE	Ellipsoid Two narrow ditches Buildings oriented NW-SE	Circular Dozens of ditches Buildings oriented NW-SE
Architectural layers	7 building levels one onto another	12 buildings levels one onto another	7 buildings levels one onto another
Architecture	Frequently fired daub buildings Large buildings Variety of construction techniques	Often unfired daub buildings Medium-sized buildings Preference of two construction techniques	Often unfired daub buildings No info on size of buildings No info on preferences
Clay installations	Frequent Large Granaries, ovens, bins, oval tubs	Rare Small Ovens, grinding structure	No Structures of grinding stones Hearth cut in rock
Pottery	Commonly black painted design on fine vessels	Commonly white painted design on fine vessels	Commonly white painted design on fine vessels
Figurines	Stylistic Sexless Coarse	Realistic Female Fine	Realistic Female Fine
Anthropomorphic house models	Faceless cylinder Absence of architectural features Rectangle and crescent openings	Human cylinder Architectural features M like openings	Human cylinder Architectural features M like openings
Altars	Tablets Central perforation Zig-zag applications	Architectural Deer head protomes Zig-zag applications	Architectural Deer head protomes Zig-zag applications
Sling shots	Frequent	Rare	Rare
Stamp seals	Absent	Rare	Not found
Incised discs	Rare	Absent	Rare
Archaeobotany	High density of remains of wheat	High density of remains of wheat	High density of remains of wheat
Archaeozoology	Large bones	Rarely bones	Frequently and cut bones

Table II. State of research on the three tells	VLAHO	VELUŠKA TUMBA VRBJANSKA ČUKA	Collaborating researchers and institutions
Excavation	Small scale	Medium scale	Center for Prehistoric Research, Museum of Prilep and Museum of Bitola
Geophysical scanning	Partial	Complete	M. Przybila (Pryncipat company)
Dating	Small scale	Medium scale	external laboratories, coordinated by G. Naumov, F. Antolín and J. Gibaja
Geoarchaeology	Small scale	Small scale	K. Penecić (Univ. of Belgrade)
Archaeobotany	Small scale	Medium scale	Seeds by F. Antolín, R. Soteras (DAI), A. Sabanov (PhD at Univ. Belgrade). Charcoal by R. Piqué (Aut. Univ. of Barcelona)
Zooarchaeology	Small scale	Medium scale	I. Živaljević and V. Dimitrijević (Uni Bel)/A. Fidanoska (AMM)
Anthropology	Not performed	Not performed	F. Veljanovska (Archaeological Museum of Macedonia)
Lipid analysis	Not performed	Small scale	D. Stojanovski (UGD)
Isotope analysis	Not performed	Small scale	S. Stefanović (Univ. of Belgrade)
Use-wear analysis	Not performed	Small scale	J.F. Gibaja (CSIC) and N. Mazzucco (Univ. Piza)
Pottery study	Small scale	Medium scale	G. Naumov
Figurines study	Small scale	Medium scale	G. Naumov

Tools study	Small scale	Medium scale	J.F. Gibaja (CSIC), N. Mazzucco (Univ. Firenze) and G. Naumov
Daub analysis	Not performed	Small scale	J. Anvari (Univ. of Colog.)
GIS analysis of tells	Not performed	Small scale	G. Milevski (Center for Prehistoric Research)
DEM modeling	Small scale	Medium scale	H. Talevski (Institute for Old Slavic Culture)
3D modeling of buildings/finds	Not performed	Small scale	J. Pendić (Univ. of Belgrade) and H. Talevski (Institute for Old Slavic Culture)

PELAGONIA PROJECT 2023 Budget Worksheet (in Euros)

PROJECT BUDGET	
Personnel: Our established and fruitful collaboration with the Prilep and Bitola museums	2023
during fieldwork requires fees for the museum staff that assist in our fieldwork.	(costs in euros)
Fee for 5 archaeologists (excavators) for 2 months at a cost of 800€ per month	8,000
Fee for 2 assistants for 1 month at a cost of 450€/month	900
	8,900
Travel	2023
Return plane tickets Serbia-Macedonia: 150€ per field season, 2 persons	300
Provision of 1 jeep for use during field seasons (Vlaho is inaccessible with regular car)	5,000
Gas for driving during field seasons	500
Accommodation: 12 participants in each field season who are from outside Prilep will be accommodated in rented apartments in Prilep during work at VČ (1 apartment per month = 250€, 4 apartments for 4 weeks of fieldwork) and in a monastery in Velušina during work at VT (5€ per person per day, 5 rooms for 4 weeks of fieldwork).	1,800
Food: for 12 people at 420€ per week, 9 weeks of fieldwork.	2,000
	9,600
Contractual	2023
Geophysical scanning	1,500
	1,500
TOTAL PROJECT COSTS	20,000

РЕПУБЛИКА СЕВЕРНА МАКЕДОНИЈА НАЦОНАЛНА УСТАНОВА ЗАВОД ЗА ЗАШТИТА НА СПОМЕНИЦИТЕ НА КУЛТУРАТА И МУЗЕЈ-БИТОЛА

Научно здружение ШИП-ШЕНТАР ЗА истражување на предисторијата 6p. 0307-19/5 10.10 20 19 год

Договор за соработка На проектот

"Археоботаничка анализа на органските остатоци од неолитскиот локалитет Велушка Тумба во Пелагонија"

Склучен меѓу:

- **1. Завод за заштита на спомениците на културата и музеј Битола,** со адреса на Климент Охридски бб, 7000 Битола, претставуван од Мери Стојанова (оттука до крај именуван како: Музејот);
- **2. Центар за истражување на предисторијата ЦИП,** со адреса на ул. Киро Крстевски Платник 11-2/7, 1000 Скопје, претставуван од доц. д-р Гоце Наумов (оттука до крај именуван како: Центарот);
- **3.** Оддел за интегративна предисторија и археолошки науки, Катедра за науки за животна средина, Универзитет во Базел, со адреса на Шпалеринг 145, 4055 Базел, претставуван од проф. д-р Феран Антолин (оттука до крај именуван како:

Уни ворритет SAT BASEL Institut für Prähistorische und Naturwissenschaftliche Archäologie

Член 1

Приложениот договор ги регулира правата и одговорностите на трите страни потписнички за имплементација на проектот "Археоботаничка анализа на органските остатоци од неолитскиот локалитет Велушка Тумба во Пелагонија" (оттука до крај именуван како: Проектот).

Член 2

Проектот ќе биде реализиран од 05.02.2020 до 05.02.2025 и ќе ги инкорпорира следните активности:

- анализа на органски остатоци;
- теренско истражување;
- документирање на наоди;
- радиокарбон анализи на примероци;
- анализи на стабилни изотопи во примероци;
- јавни предавања во Македонија и Швајцарија;
- презентација на резултатите од истражувањата на конференции;
- публикација на текстови со резултати од проектот;
- обезбедување на материјали од истражувањето до Универзитетот, Центарот и Музејот.

Член 3

При подготовка на археолошкото истражување кое произлегува од проектот, Музејот и Центарот се согласуваат за следното:

- бирање адекватни истражувачи за целите на проектот;

- подготовка на потребната документација за соработка;
- обезбедување на дозволи за истражување и изнесување на примероци;
- обезбедување на пристап до органските остатоци од локалитетот Велушка Тумба што се депонирани во Музејот;
- обезбедување на работен простор во Музејот;
- обезбедување на возило и опрема од Центарот;
- учество во истражувањето, публикувањето, јавните предавања, семинари и конференции поврзани со Проектот;
- публикување на резултати од истражувањата заедно со археолозите и археоботаничарите инволвирани во Проектот;
- обезбедување на работни извештаи до Универзитетот после нивното доставување во Управата за заштита на културното наследство.

Член 4

При подготовка на археоботаничкото истражување кое произлегува од проектот, Универзитетот се согласува на следното:

- формирање на истражувачки тим во согласност со целите на проектот;
- вршење на археоботаничко истражување на локалитетот и во Музејот;
- покривање на трошоците поврзани со истражувањето;
- анализа на примероците во соодветни лаборатории;
- враќање на примероците во Музејот до една година после нивното изнесување;
- обезбедување на документација од истражување до Центарот и Музејот;
- одржување предавања/работилници во Музејот;
- публикување на резултати од истражувања заедно со археолозите инволвирани во проектот;
- обезбедување на работни извештаи до Музејот и Центарот.

Член 5

Центарот, Музејот и Универзитетот ќе допринесуваат за тимот од академски истражувач и студенти одговорни за извршување на истражувачките активности во контекст на анализи на органски остатоци, документирање, истражувања во библиотеки, предавања за јавност, семинари, конференции и публикација на текстови и ќе доставуваат извештаи за Проектот после секоја завршена фаза од Проектот до националните институции.

Академско-истражувачкиот тим ќе се состои од вкупно 2 (два) кораководители и 4 (четири) истражувачи:

- Гоце Наумов, доц. д-р, Центар за истражување на предисторијата (кораководител и истражувач);
- Феран Антолин, проф. д-р, Универзитет во Базел (ко-раководител и истражувач);
- Јасмина Гулевска, кустос, Завод и музеј Битола (научен соработник);
- Раул Сотерас, лабораториски техничар, Универзитет во Базел, (научен соработник);

 Амалиа Шабанов, м-р, археоботаничар, Универзитет во Базел и Универзитет во Белград (научен соработник);

Член 6

Центарот, Музејот и Универзитетот се обврзуваат на публикување академски текстови по завршувањето на секоја фаза од проектот со вклучување на главните учесници во проектот од сите партнерски институции.

Naturwissenschaftliche Archäoroci

Член 7

Центарот, Музејот и Универзитетот се обврзуваат на подготовки и презентации поврзани со резултатите од Проектот после секоја фаза на проектот со вклучување на главните учесници во проектот од сите партнерски институции.

Член 8

Страните потписнички ќе ги именуваат координаторите инволвирани во проектот, кои се обврзуваат сите активности во рамки на Проектот да бидат адекватно и навремено имплементирани и во согласност со Законот за културно наследство и Законот за музеи на Република Македонија.

Член 9

Страните потписнички се обврзуваат спогодбено и со добра волја да ги решат сите несогласувања кои би можеле да се појават во периодот кога овој договор е важечки, додека ја признаваат надлежноста на Основниот Суд во Скопје во случај некои од различностите да не можат да бидат решени.

Член 10

Приложениот договор ќе биде потпишан во 6 (шест) идентични копии, од кои 2 (две) ќе им припаѓаат на секоја од потписничките.

Член 11

Приложениот договор е важечки од денот на неговото потпишување.

Во име на Завод за заштита на спомениците на културата и музеј - Битола

Потпишан билом на 20/2/2020

Мери СТОЈАНОВА, д-р В.Д. Директор на Завод за заштита на спомениците на културата и музеј – Битола

Во име на Центарот за истражување на предисторијата

Потпишан Сстр на10/02/2020

Гоце НАУМОВ, доц. д-р

Претседател на Центарот за истражување на предисторијата

Во име на Одделот за интегративна предисторија и археолошки науки, Катедра за науки за животна средина, Универзитет во Базел UNIVERSITÄT BASEL

Потпишан <u>Basel</u> на<u>22/2/2020</u>.

UNIVERSITAT BASEL Institut für Prähistorische und Naturwissenschaftliche Archäologie Spalenring 145 CH-4055 Basel

Феран АНТОЛИН, проф д-р

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UNIVERSITÄT BASEL

Institut für Prähistorische und Република Македонија Naturwissenschaftliche Archäologi: Национална установа

ЗАВОД ЗА ЗАШТИТА НА СПОМЕНИЦИТЕ

НА КУЛТУРАТА И МУЗЕЈ - ПРИЛЕП

Бр. <u>03-47/5</u> 4. <u>03</u> 2080 год.

Договор за соработка на проектот

"Археоботаничка анализа на органските остатоци од неолитскиот локалитет Врбјанска Чука во Пелагонија"

Склучен меѓу:

но заружение ЦИП-ЦЕНТАР ЗА

10.2 20 20 rod.

ИСТРАЖУВАЊЕ НА ПРЕДИСТОРИЈАТА

50 0307-20/01

Ckonje

- **1. Завод за заштита на спомениците на културата и музеј Прилеп,** со адреса на Александар Македонски 142, 7500 Прилеп, претставуван од Благоја Атанасоски (оттука до крај именуван како: Музејот);
- **2. Центар за истражување на предисторијата ЦИП,** со адреса на ул. Киро Крстевски Платник 11-2/7, 1000 Скопје, претставуван од доц. д-р Гоце Наумов (оттука до крај именуван како: Центарот);
- **3.** Оддел за интегративна предисторија и археолошки науки, Катедра за науки за животна средина, Универзитет во Базел, со адреса на Шпалеринг 145, 4055 Базел, претставуван од проф. д-р Феран Антолин (оттука до крај именуван како: Универзитетот);

Член 1

Приложениот договор ги регулира правата и одговорностите на трите страни потписнички за имплементација на проектот "Археоботаничка анализа на органските остатоци од неолитскиот локалитет Врбјанска Чука во Пелагонија" (оттука до крај именуван како: Проектот).

Член 2

Проектот ќе биде реализиран од 10.02.2020 до 10.02.2025 и ќе ги инкорпорира следните активности:

- анализа на органски остатоци;
- теренско истражување;
- документирање на наоди;
- радиокарбон анализи на примероци;
- анализи на стабилни изотопи во примероци;
- јавни предавања во Македонија и Швајцарија;
- презентација на резултатите од истражувањата на конференции;
- публикација на текстови со резултати од проектот;
- обезбедување на материјали од истражувањето до Универзитетот, Центарот и Музејот.

Член 3

При подготовка на археолошкото истражување кое произлегува од проектот, Музејот и Центарот се согласуваат за следното:

- бирање адекватни истражувачи за целите на проектот;

- подготовка на потребната документација за соработка;
- обезбедување на дозволи за истражување и изнесување на примероци;
- обезбедување на пристап до органските остатоци од локалитетот Врбјанска Чука што се депонирани во Музејот;
- обезбедување на работен простор во Музејот;
- обезбедување на возило и опрема од Центарот;
- учество во истражувањето, публикувањето, јавните предавања, семинари и конференции поврзани со Проектот;
- публикување на резултати од истражувањата заедно со археолозите и археоботаничарите инволвирани во Проектот;
- обезбедување на работни извештаи до Универзитетот после нивното доставување во Управата за заштита на културното наследство.

Член 4

При подготовка на археоботаничкото истражување кое произлегува од проектот, Универзитетот се согласува на следното:

- формирање на истражувачки тим во согласност со целите на проектот;
- вршење на археоботаничко истражување на локалитетот и во Музејот;
- покривање на трошоците поврзани со истражувањето;
- анализа на примероците во соодветни лаборатории;
- враќање на примероците во Музејот до една година после нивното изнесување;
- обезбедување на документација од истражување до Центарот и Музејот;
- одржување предавања/работилници во Музејот;
- публикување на резултати од истражувања заедно со археолозите инволвирани во проектот;
- обезбедување на работни извештаи до Музејот и Центарот.

Член 5

Центарот, Музејот и Универзитетот ќе допринесуваат за тимот од академски истражувач и студенти одговорни за извршување на истражувачките активности во контекст на анализи на органски остатоци, документирање, истражувања во библиотеки, предавања за јавност, семинари, конференции и публикација на текстови и ќе доставуваат извештаи за Проектот после секоја завршена фаза од Проектот до националните институции.

Академско-истражувачкиот тим ќе се состои од вкупно 2 (два) кораководители и 4 (четири) истражувачи:

- Гоце Наумов, доц. д-р, Центар за истражување на предисторијата (кораководител и истражувач);
- Феран Антолин, проф. д-р, Универзитет во Базел (ко-раководител и истражувач);
- Александар Миткоски, кустос-советник, Завод и музеј Прилеп (научен соработник);

- Раул Сотерас, лабораториски техничар, Универзитет во Базел, (научен соработник);
- Амалиа Шабанов, м-р, археоботаничар, Универзитет во Базел и Универзитет во Белград (научен соработник);

Член б

Центарот, Музејот и Универзитетот се обврзуваат на публикување академски текстови по завршувањето на секоја фаза од проектот со вклучување на главните учесници во проектот од сите партнерски институции.

Член 7

Центарот, Музејот и Универзитетот се обврзуваат на подготовки и презентации поврзани со резултатите од Проектот после секоја фаза на проектот со вклучување на главните учесници во проектот од сите партнерски институции.

Член 8

Страните потписнички ќе ги именуваат координаторите инволвирани во проектот, кои се обврзуваат сите активности во рамки на Проектот да бидат адекватно и навремено имплементирани и во согласност со Законот за културно наследство и Законот за музеи на Република Македонија.

Член 9

Страните потписнички се обврзуваат спогодбено и со добра волја да ги решат сите несогласувања кои би можеле да се појават во периодот кога овој договор е важечки, додека ја признаваат надлежноста на Основниот Суд во Скопје во случај некои од различностите да не можат да бидат решени.

Член 10

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Член 11

Приложениот договор е важечки од денот на неговото потпишување.

Во име на Завод за заштита на спомениците на културата и музеј - Прилеп

5 Потпишан Дрине на <u>4/3/202</u>5. Благоја АТАНАСОСКИ. В.Д. Директор на Завод за заштита на спомениците на културата и музеј – Прилеп

Во име на Центарот за истражување на предисторијата

Потпишан Сстр на10/02/2020

Гоце НАУМОВ, доц. д-р

Претседател на Центарот за истражување на предисторијата

Во име на Одделот за интегративна предисторија и археолошки науки, Катедра за науки за животна средина, Универзитет во Базел UNIVERSITÄT BASEL

Потпишан <u>Basel</u> на<u>22/2/2020</u>.

UNIVERSITAT BASEL Institut für Prähistorische und Naturwissenschaftliche Archäologie Spalenring 145 CH-4055 Basel

Феран АНТОЛИН, проф д-р

Оддел за интегративна предисторија и археолошки науки, Универзитет во Базел



FOUNDATION FOR THE **STUDY** AND **PRESERVATION** OF **TELLS** IN THE PREHISTORIC OLD WORLD

Neuffenstraße 57 · D-73734 Esslingen am Neckar

Dr. Goce Naumov Center for Prehistoric Research Museum of Macedonia Kiro Krstevski Platnik 11-2/7 1000 Skopje Republic of North Macedonia

14.01.2023

Subject: Chronology, society and environment of the Neolithic tells in Pelagonia

Dear Dr. Naumov,

following the recent meeting of our boards, I would like to let you know that your proposal 'Chronology, society and environment of the Neolithic tells in Pelagonia' has found approval regarding the aims and the quality of your work proposed and your project's match with the purpose of the foundation's statutes. We also wish to congratulate you on the work done in 2022!

However, our advisory board has also expressed concerns about the targeted duration and the project scope. Although the addition of another site, which is threatened by destruction, is considered understandable, doubts are expressed about the existence of a long-term strategy and tell-specific questioning beyond the as comprehensive as possible coverage of the Pelagonian Neolithic landscape and sites aimed at. Nevertheless, renewed funding of the project for 2023 is considered desirable, especially with regard to the broad canon of methods envisaged, which has not yet been applied in this region and promises significant progress in knowledge. In view of the multi-annual nature of the planned project, however, the board has asked to signal that no guarantee can be given with regard to further funding in subsequent years and that it may be desirable to refocus the approach and the tell-specific aims of the project if further applications to the foundation are considered.

We are pleased, therefore, to inform you that the foundation is ready to support your work in 2023 with funds amounting to **10.000** Euro for expenses as stated in your application and budget calculation.

Funding is subject to your written acceptance of our funding guidelines and general information for applicants attached to this letter. Please note, in particular, our invoicing regulations, and that we require receipts for all travel and material expenses *etc*. granted.

A final report and settlement on your work is to be submitted at the latest six weeks after expiry of the funding period, *i.e.* by February 2024.

Although we have taken note that your project is scheduled to be multi-annual, we kindly ask you to submit a follow-up application in case you should seek our support beyond the current funding period.

In our assessment of such a re-application we will certainly take the positive evaluation of your first two proposals into consideration. However, please do note that, at this point, for legal and fiscal reasons we cannot commit ourselves to funding the continuation of those projects that will be supported in 2023, since our funding activity will depend on the means available and the applications that we receive. So please make sure to also be in touch with other funding agencies and to inquire alternative options for ensuring the continuity of your work.

Should you have any questions please do not hesitate to get in touch.

We wish you every success in your work on this project and remain with best regards, yours sincerely,

THil

Prof. Dr. Tobias L. Kienlin (Chairman)
Attachment: Funding Guidelines and General Information for Applicants (2023 version)

Abhandlung

Goce Naumov*, Aleksandar Mitkoski, Hristijan Talevski, Jana Anvari, Marcin Przybyła, Darko Stojanovski, Ferran Antolín, Amalia Sabanov, Ivana Živaljević, Vesna Dimitrijević, Juan F. Gibaja, Niccolò Mazzucco, Gjore Milevski, Nikola Dumurđanov, Jugoslav Pendić, Zlata Blažeska and Sofija Stefanović

The Early Neolithic tell of Vrbjanska Čuka in Pelagonia

https://doi.org/10.1515/pz-2021-0007

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Sofija Stefanović, BioSense Institute, University of Novi Sad/ Laboratory for Bioarchaeology, University of Belgrade, Serbia. E-Mail: sofija.stefanovic@biosense.rs Zusammenfassung: Vrbjanska Čuka ist ein Tell in der Region Pelagonien (Mazedonien), der vor 8000 Jahren entstand. Während der Römerzeit und im Mittelalter fand hier Landwirtschaft statt, zudem wurde der Hügel als Grabstätte genutzt. Die in den 1980ern sowie während der letzten fünf Jahre erfolgten Ausgrabungen führten den Beleg einer neolithischen bäuerlichen Gesellschaft, die in einer von einem kreisförmigen Graben umschlossenen Siedlung große Gebäude aus Lehm errichtete. In den Gebäuden wurden zahlreiche Lehmstrukturen nachgewiesen, etwa Öfen, Getreidespeicher sowie Bereiche zur Verarbeitung von Getreide und die Herstellung von Brot. Die neolithischen Gemeinden nutzten qualitätvolle Töpferwaren, modellierten Figuren und Altäre, während die hier geborgenen Steinwerkzeuge hauptsächlich zum Fällen von Bäumen, zur Ernte oder für das Mahlen von Getreiden verwendet wurde. Neben Nahrungsmitteln aus Getreide (Einkorn, Emmer, Gerste) konsumierten die Einwohner von Vrbjanska Čuka Linsen, Erbsen und eine Vielzahl wildgesammelter Früchte. Die Ernährung bereicherten ferner Rind-, Ziege/Schaf- und Wildfleisch, außerdem Muscheln und Fisch sowie Milchprodukte. Der vorliegende Beitrag fasst eine Vielzahl von international und multidisziplinär ermittelten Daten zusammen. Diese basieren auf örtlichen Ausgrabungen, Prospektionen, geomagnetischen Untersuchungen, Studien zur materiellen Kultur, der Architektur, Radiokarbondatierungen, geoarchäologischen, archäobotanischen, archäozoologischen und Lipiduntersuchungen. Hinzu kommen Gebrauchsspuranalysen, Studien zur Topografie sowie 3D-Modellierungen. Die Untersuchungen in Vrbjanska Čuka erbrachten neues Wissen zum frühen Neolithikum in Pelagonien und tragen ferner zum umfassenderen Verständnis der ersten bäuerlichen Gesellschaften auf dem Balkan bei.

Schlüsselworte: Pelagonien; Neolithikum; Tells; bäuerliche Gemeinschaften; Ausgrabungen; Laboranalysen

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Abstract: Vrbjanska Čuka is a tell site in the region of Pelagonia (Macedonia) established 8000 years ago by the Neolithic communities. Later it was used as an agricultural unit during the Roman era and the Middle Ages when it was also employed as a burial area. The excavations performed in the 1980s and during the last five years indicate a Neolithic farming society that constructed large buildings made of daub in a settlement enclosed by a circular ditch. The buildings had many clay structures, such as ovens, granaries, bins and grinding areas for processing cereals and bread production. The Neolithic communities used sophisticated fine pottery and modeled figurines and altars, while the stone tools were mainly used for cutting trees, harvesting and grinding. Apart from the cereal-based food (einkorn wheat, emmer wheat or barley), the inhabitants of Vrbjanska Čuka consumed lentils, peas and a variety of gathered wild fruits, while cattle, caprovine, mussels, fish and wild game meat was also part of a diet, as well as the dairy products. This paper will be a summary of a variety of data provided from the current international and multidisciplinary research of the site that involves excavation, prospection, geomagnetic survey, study of material culture, examination of architecture, radiocarbon dating, geoarchaeological, archaeobotanical, archaeozoological, lipid and use-wear analyses, as well as the topographic and 3D modeling. The recent knowledge on Vrbjanska Čuka provides novel understanding of the Early Neolithic in Pelagonia and contributes to the more extensive research of first farming societies in the Balkans.

Keywords: Pelagonia; Neolithic; tells; farming societies; fieldwork; laboratory analysis

Апстракт: Врбјанска Чука претставува тумба во котлината Пелагонија (Македонија), основана од неолитските заедници пред 8000 години. Била користена како стопанска целина за време на Римската Империја, но и во текот на средниот век кога исто така функционирала и како некропола. Ископувањата вршени во 1980-те и во последните пет години укажуваат на неолитско земјоделско општество кое конструирало големи градби направени од лепеж во населба заштитена со кружен ров. Во градбите се наоѓале многу глинени конструкции, како што се печки, амбари, сандаци и места за мелење и обработка на житни култури при подготовка на леб. Неолитските заедници користеле софистицирана фина керамика и моделирани фигурини и жртвеници, додека камените алатки главно се користеле за сечење дрвја, жнеење и мелење. Освен храната на база на житни култури (еднозрнеста и двозрна пченица или јачмен),

жителите на Врбјанска Чука исто така конзумирале леќа, грашок, разновидно овошје, говедско, овчо и свинско месо, школки, риба и месо од дивеч, како и млечни производи. Овој труд ќе биде резиме на различни податоци добиени од тековните меѓународни и мултидисциплинарни истражувања на локалитетот, а кои вклучуваат ископување, рекогносцирање, геомагнетно скенирање, проучување на материјалната култура, испитување на архитектурата, студии за функциите на алатките, радиојаглеродно датирање, геоархеолошка, археоботаничка, археозоолошка и липидна анализа, како и топографско и 3Д моделирање. Добиените сознанија за Врбјанска Чука даваат ново разбирање на раниот неолит во Пелагонија и придонесуваат за поопсежно истражување на првите земјоделски општества на Балканот.

Клучни зборови: Неолит, тумби, земјоделски општества, теренски истражувања, лабораториски анализи

Introduction

The Neolithization of the Balkans has been studied from different perspectives and various regions were considered in order to understand the modes and routes of its implementation among the first farming societies on this peninsula. One of these regions that was inhabited early on by the agricultural communities is Pelagonia, an elongated valley in Macedonia surrounded by diverse mountains. The initial interest in the prehistory of Pelagonia started in the first half of 20th century, but the major research was done after World War II and particularly in the 1970s, when a number of excavations were performed on various tells, a major settlement feature in this region¹. The archeological research in Pelagonia was significantly reduced in the three following decades², but a novel interest started in 2010s when numerous excavations, prospection, geophysical surveys, studies of material culture and laboratory analyses were initiated by introducing current methods and scientific perspectives³. Such approaches, along with data obtained from 1970s, provided a new understanding of the region and the first farming communities that established a number of tells.

One of the tells that raised particular interest is Vrbjanska Čuka, a complex archaeological site in the north-

¹ Grbić *et al.* 1960; Simoska/Sanev 1975; Simoska/Sanev 1976; Kitanoski 1977; Simoska/Sanev 1977; Simoska *et al.* 1979.

² Kitanoski 1989; Simoska/Kuzman 1990;

³ Naumov et al. 2014; Naumov/Tomaž 2015; Naumov 2016a; Naumov et al. 2017a; Naumov et al. 2017b; Naumov et al. 2018a; Naumov 2020.



Fig. 1: Map of Pelagonia with indicated position of Vrbjanska Čuka

ern part of Pelagonia (Fig. 1). It was discovered in 1977 and several fieldwork campaigns were initiated in the 1980s, when the central part of the tell was excavated⁴. This led to the discovery of several buildings and constructions, as well as numerous vessels, house models, tablet-altars, figurines and tools common in the Pelagonian Neolithic⁵. After a break of nearly three decades, the excavation of this site continued in 2016 with uninterrupted fieldwork campaigns and laboratory analyses. Each fieldwork season involved

the application of new methods of archaeological research in North Macedonia, such as geomagnetic scanning, digital topography of the tell, radiocarbon dating, the study of architectural remains and material culture, 3D modeling of finds and structures, archaeozoological, archaeobotanical, use-wear and lipid analyses, as well as detailed prospection of the surrounding sites⁶. This is a result of joint research in the project lead by the Center for Prehistoric Research in collaboration with the Institute and Museum –

⁴ Kitanoski *et al.* 1990.

⁵ Kitanoski 1989; Mitkoski 2005.

⁶ Naumov *et al.* 2018a; Naumov *et al.* 2018b; Naumov *et al.* 2018c; Naumov et al. *in press*.



Fig. 2: The Vrbjanska Čuka tell, view from South (Photo: Goce Naumov).

Prilep, Institute of Old Slavic Culture, BioSense Institute, University of Basel, Spanish National Research Council, University of Cologne, University of South Bohemia, University of Bern, University of Primorska, as well as the companies Pryncipat and VR Port. The specialists and students from the project partners contributed to a completely novel insight into the tell, giving a much better understanding of the farming communities who established and lived in this settlement. This paper is therefore comprised of the results obtained from aforementioned research in Vrbjanska Čuka from 2016 until 2020 and place this site more thoroughly within the archaeological map of the Neolithic Balkans.

Vrbjanska Čuka is positioned between Slavej and Vrbjani, 1.3 km south and southeast respectively from these villages. The site is constituted by a tell in a valley surrounded by the Buševa, Dautica, Babuna, Selečka mountains and Topolnićka Greda hill, and it is close to Crna Reka (the largest river in Pelagonia), whose tributaries are now dried out. It is a tell 3.5 m high and 180 m in diameter, elevated above the flatlands, with a few more tells surrounding Vrbjanska Čuka (Fig. 2)⁷. The site's initial settlement was established during the Early Neolithic and, after a huge occupational gap of 6 millennia, it was used as Roman villa rustica with a number of pits in which presumably storage vessels were deposited. A similar economic function was maintained in the Medieval period, with a greater number of pits, but the site was also used as a necropolis where the inhabitants from the surrounding villages were buried. The radiocarbon analysis of samples from the lowest and top levels indicates the earliest and latest periods of site occupation additionally supported by the distinctive Neolithic and Medieval material culture. Currently, the tell is used as an agricultural field, upon which a farm was built in the 1950s and 1970s, and sand was extracted which damaged a large part of the site⁸.

Since 2016, the scope of research was larger than that from the 1980s, mostly due to the extension of the trench, but also because of the larger number of experts and institutions engaged during and after the excavation (Fig. 3). The excavations were initially performed in the same trench from 1980s, but since 2016 have been significantly extended towards the north and west. Apart from the previously researched squares, the fieldwork is focused on the new ones as well, i.e. quadrants from 16 to 32 (except 20). These quadrants are $5 \times 5m$ large, thus the current trench now measures $20 \times 20m$. In some of the squares, the lowest layers were reached and the presence of several buildings was recorded.

During the excavation, the discovered features were documented with the Harris Matrix system which enabled a comprehensive log of all features and their documentation through stratigraphic units (SU). A dozen daub buildings with interior structures were discovered during the excavation of the few Neolithic horizons, but also numerous artifacts were discovered, which provided insight into the economic, social and symbolical spheres of farmers

⁷ Naumov et al. 2018b.

⁸ Ibid. 254–256; Mitkoski 2005.



Fig. 3: Aerial image of the trench in the center of the tell (Drone photo: Hristijan Talevski).

who established this settlement and lived there during the 6th millennium BC. Detailed excavation and documentation provided thorough insight into the stratigraphy of the site and its complexity in formative processes of various cultural horizons. Therefore, this paper will focus only on the Neolithic period determined in Vrbjanska Čuka with an emphasis on the natural, social, economic and symbolic processes detected by the study of layers, material and architecture, as well as by a variety of analyses performed in different laboratories.

Geological features of the site and the surrounding region

The Neolithic settlement of Vrbjanska Čuka was established upon eluvial and eolian deposits, which represent the uppermost soil levels of the Pelagonian valley. This valley is a tectonic depression created by young (neotectonic) rifts mainly with a North-South disposition. The depression was created in the end of the Middle Miocene and was gradually transformed into a widespread freshwater lake in which Miocene, Pliocene and Lower Pleistocene layers were deposited. The changes of tectonic conditions of the Mediterranean Sea and its deepening during the Pliocene and Lower Pleistocene initiated the creation of a new river network with larger rivers in the fields of Macedonia. Along these rivers, the outflow of the waters from Macedonian lakes towards the Aegean Sea also started through the Vardar river, a major water assembly artery created 1–0.85. Ma ago⁹. In the same period, the valley of Crna Reka was formed where the waters from Pelagonian

Lake gradually started to outflow to the Vardar River and the Aegean Sea until its definite drainage.

Afterwards, the period of intensive erosion of Pliocene sediments started, as well as several processes of decomposition of eluvial sediments, covering the valley's peripheral parts with gravel, sandy and clayish material from torrential waters, which commenced the formation of new river network. All these processes contributed to the deposition of fertile soil in the larger part of Pelagonia and to the creation of wetland areas before and during the Neolithic period. Some of them are preserved even nowadays along the riverbed of the Crna Reka, while others are covered with a relatively thin layer of soil.

In the period between 1974 and 1977, there were deep drillings in the vicinity of Vrbjanska Čuka and its wider area focused on layers with coal and potable water. Such drillings were performed in the villages of Slavej, Vrbjani, Malo Konjari, Krušeani, Borotino and others from the surrounding area of the archaeological site. The description of the cores points to several layers of clay, sand and gravel under the recent horizon which do not have features of wetland sediments (Tab. 1). Only the core D-10 extracted in the vicinity of Veselčani village, 7 km southeast from Vrbjanska Čuka, recorded sediments indicative of wetlands. This core of 52 m depth records the following deposited features:

Tab.1: List of determined deposits in one of the cores in Prilepsko Pole.

Height	Sediments
0,0 - 0,80 m	humus
0,80 - 3,90 m	black clayish material with wetland origin
3,90 - 5,80 m	gravel-sandy proluvial material
5,80 - 27,00 m	sands with different colors
27,00 - 44,50 m	sandy clays and clays with different colors
44,00 - 52,00 m	paleorelief of mikashists

⁹ Arsovski 1991.

According to the provided data, the sediments with black clayish material created above the wetlands are right under the humus layer, while the core D-10 could refer to the periphery of the marshes. The morphology of the terrain indicates possible disposition of the wetland from Vrbjani towards Veselčani so that the water flowed out towards the south. Nevertheless, in order to confirm the outlines of this wetland and its features, new geological surveys with several cores are necessary to be performed in the future.

Topographic measurement and digital elevation model of the tell

During the excavations of Vrbjanska Čuka, the topographic measurements were also conducted and digital elevation models for the tell were generated, enabling an accurate determination of the shape, volume and height of the tell, and also of its modifications resulting from the constant use of this location. Given that the site is partially damaged from the foundations of a 1950s farm, sand extraction activities, modern plowing and changes to its shape due to the vegetation, the application of geodetic measurements and modeling yielded a consistent picture of the site's look and size.

The limited visibility of the tell is due to the vegetation (high reeds and trees), but also due to the site's topography which, as the majority of Pelagonian tells, rises only slightly above the plain. Because of that, by utilizing GPS and RTK devices, a grid network of points was placed on the entire surface of the tell. A total of 172 points with an equidistance of 10 and 20 meters were recorded, including points where the surface suggested a slight decline, so the final model would be improved (Fig. 4). The measurements show that the highest point of the tell is 603.187 meters, and the lowest is 599.67 meters, while its North-South diagonal length is approximately 180 meters. The West-East diagonal length based on the visual profiles of the tell shows a much larger diameter (approximately 280 meters). Nevertheless, this value is a result of the damaged edges in this part of the tell and should not be used as a reference until further, more precise measurements have been taken. The points were then transformed in the MGI Balkan Zone 7 system and, with the application of the TIN method for interpolation, a digital elevation model was generated. The created elevation model containing height values contributed an accurate representation of the tell's outline, including its shape, height, volume and also the variations in its periphery, taking into consideration the possible ditch that surrounded the Neolithic settlement.

Apart from this outcome, the GIS modeling provides the possibility for 3D visualization of the tell and virtual documentation of the state in which the tell is today.

The construction of DEM is an important part in the research and documentation of an archaeological site¹⁰. The elevation layer for Vrbjanska Čuka was produced based on individual points and their respective heights, whereas the possibility for producing DEM based on digitalization of contour lines from topographic maps was excluded from the very beginning. The reason behind this decision are the topographic features of Pelagonian tells concerning their height¹¹. The average height of these archaeological sites is between 2 and 4 meters and in order to digitalize and generate elevation models, the research requires specific topographic maps with a high spatial grid resolution which were not available. The choice of the type of interpolation was also affected by the method of gathering the spatial data. During the parameter selection process, the TIN (Triangulated Irregular Network) method was selected, which was suitable for the production of the elevation model, because the field data that was processed in GIS and the grid of points were irregularly deployed within space¹². The excavated area in the central part of the tell (trench) was transformed into a virtual flat surface with the positioning of additional points around the trench with the dimensions 20×20 m, also in order to position the newly made UAV (drone) imagery on this area.

Geomagnetic scanning

After the site excavation, the process of geomagnetic surveying of Vrbjanska Čuka and several neighboring tells started. Magnetic measurements were made with Flux-gate magnetometer 4.032 DLG Foerster Ferrex, equipped with two sensors with resolution of 0,2 nT that measures the degree of vertical component of the Earth's magnetic field. The data was collected in two-way format (10 measurements were taken in one square meter). A large number of anomalies from various characters were processed and mapped in Terra Surveyour.

This method was previously applied during the research on prehistoric tells in Pelagonia, and because of its exceptional results it was used in the archaeological fieldwork associated with this site and its surrounding tells¹³.

¹⁰ Westcott/Brandon 2000.

¹¹ Naumov *et al.* 2014.

¹² Wheatley/Gillings 2002.

¹³ Naumov et al. 2014; Naumov et al. 2017b; Naumov 2020.



Fig. 4: Digital Elevation Model and visual section of the tell (Illustrations: Gjore Milevski and Hristijan Talevski).



Fig. 5: Map of the tells where the geomagnetic survey was performed: 1. Vrbjanska Čuka-Slavej; 2. Tumba-Borotino; 3. Krušeanska Čuka-Vrbjani; 4. Konjarski Vis-Slavej (Illustration: Marcin Przybyła).

In appropriate conditions, clear anomalies are created from the remains of buildings made of daub and in rare cases from those made of stone. Human activity increases the sensitivity of the upper layer of the soil, which causes the phenomenon manifested as "zonal" magnetic anomalies¹⁴. As a result, the magnetic method allows almost complete recognition of archaeological sites and prehistoric ones in particular. Nevertheless, the main drawback is the small depth of penetration, rarely surpassing more than 1–1.5 meters¹⁵. The survey provided a completely new knowledge for Vrbjanska Čuka consisting of dozens of buildings enclosed by a ditch, but also provided an insight into the spatial organization of the tells neighboring this site (Fig. 5)¹⁶.

The geomagnetic research of this site included a total area of 3.6 hectares, partially transformed in modern times. The presence of high voltage pylons and remnants of farm foundations caused numerous disturbances, which affected the readability of the results. Apart from that, several anomalies related to the Neolithic tell were discovered. The results are shown in the form of magnetic maps in grayscale (Fig. 6a). The interpretation of these particular anomalies indicates the following characteristics: a linear positive anomaly associated with a defensive ditch (with two hypothetical entrances (Fig. 6b, 10); a linear positive anomaly associated with a smaller ditch or a communication line (e.g. path, Fig. 6b, 11); a group of dipolar anomalies associated with remains of burned clay from the buildings (Fig. 6b, 12–30); two groups of dipolar anomalies forming a square structure in the central part of the site (may be related to the building of the Roman period (Fig. 6b, 31–32); a group of positive anomalies connected to the remains of buildings outside of the tell (Fig. 6b, 33); a linear positive

¹⁴ Misiewicz 2006.

¹⁵ David et al. 2008.

¹⁶ Naumov et al. 2018a.



Fig. 6: Results from the geomagnetic survey: a/b. Vrbjanska Čuka; c. Tumba-Borotino; d. Krušeanska Čuka (Illustrations: Marcin Przybyła).

anomaly most likely associated with 'Building number 33' (Fig. 6b, 34); and a probable group of positive anomalies associated with remains of a building (Fig. 6b, 35).

As mentioned above, besides Vrbjanska Čuka, the neighboring tells were part of the geomagnetic scanning, such as Konjarski Vis, Borotino and Krušeanska Čuka (Fig. 5). The reconnaissance of Konjarski Vis indicates a surface material synchronous to Vrbjanska Čuka and some belonging to later prehistoric periods, but geomagnetic data provides information for entirely different architectural features and spatial organization¹⁷. Tumba-Borotino surface survey records the presence of Late Neolithic and Chalcolithic vessels and figurines, while the scans demonstrate a site with several concentric ditches on one side of tell, as well as entirely different features on the other side of it, most likely burials (Fig. 6c)¹⁸. Krušeanska Čuka is a Chalcolithic tell excavated in the 1980s and surveyed in 2017¹⁹. The geomagnetic research indicates that there is a small, fortified settlement of circular shape (approximately 70 m in diameter) consisting of defensive ditches full of burned material, burned walls or palisades, buildings and

¹⁷ Ibid. 128; Naumov et al. 2017b, 16.

¹⁸ Ibid. 129.

¹⁹ Temelkoski 1999; Naumov et al. 2017b, 14.

pits (Fig. 6d). In sum, the reconnaissance and scanning confirm the presence of Neolithic and Chalcolithic tells not far from Vrjbjanska Čuka, but in a way different regarding the spatial organization. Future excavation of these sites could provide more information on the social structure of communities that established them, but also the similarity or diversity of architectural features with those in Vrbjanska Čuka.

Stratigraphy of Vrbjanska Čuka

By using the Harris Matrix system, a very detailed stratigraphy overview of the settlement was made by defining all archaeological features referred to as stratigraphic units. Thus, a significant number of layers were recorded in the Neolithic horizons, but also new features in the Classical and Medieval horizons. Following the stratigraphy from the most recent down to the oldest layers, certain interpretations can be suggested. There are Medieval and Classical horizons that are difficult to separate, as well as three Neolithic ones primarily defined by the architectural features and their layers (Fig. 7). The features of the Neolithic horizons will be more thoroughly presented here through architecture and finds, whereas the detailed overview of later horizons and its material culture has been provided in the previous publications²⁰.

Contrary to the interpretations from the 1980s research concluding that the Neolithic settlement was single-layered²¹, a detailed observation of the sections and features within the trench proved otherwise, as there are three Neolithic horizons that are the outcome of continuous settlement occupation during the first half of 6th millennium BC²². The new excavation results indicate that the initial settlement was established atop a smaller, natural elevation composed of a thick sand deposit originating from a Neogene lake²³. On top of these deposits, multiple daub buildings were subsequently built, destroyed and rebuilt over a period of ca. 300 years, according to available radiocarbon dates. As a result, 1.10 m of Early Neolithic deposits have been accumulated and at least 6 building phases have been identified without indicative natural interruptions. The building phases mentioned above are tentatively grouped into three Neolithic horizons, nominally determined according to the architectural features, as detailed analysis of material from each level is not yet finalized (Fig. 7).

The latest Neolithic horizon (III) lies just beneath the Classical layer, with architectural remains and pits from the Roman period clearly separated by the soil structure. The soil is gray and particularly compact, significantly different from the one above. Such compactness could be due to the long exposure of the horizon to weather conditions and its usage as a surface for new activities 6,000 vears later. It is evident that burning took place in this horizon, hence its gray soil could partly derive from the ashes; however, this could also be due to various climate processes occurring over the past 6 millennia, during which there were no settlers on the tell. Material found in this horizon does not significantly differ from the one in the Early Neolithic horizons, therefore the Late Neolithic phase of the settlement cannot be assumed. Numerous grinding stones, foundations and posts from Buildings 6, 8, 12 and 14 have been found there, so it is evident that the settlement was active in this period in terms of everyday life and cereal processing. Given its exposure, this horizon, as those below it, were considerably damaged by Late Classical and Medieval activities, i.e. the digging of larger pits. Therefore, apart from the Neolithic material, there were pottery fragments, terracotta building materials, human and animal skeletal remains inside the fill of these pits used in these later stages of the archaeological site.

Although significantly smaller in terms of stratigraphic features and height, the next horizon (II) is different. All constructed features detected within it consisted of burnt daub, which is atypical for the horizon above. Buildings 4 and 15 were associated with this horizon that also contains large amounts of ceramic and lithic finds, among which include elements similar to those in the upper Neolithic horizon (III). Several layers have been determined in this horizon, consisting of thick burnt daub walls and plaster, referring to an intense period of activity within the settlement. They are a result of relatively frequent activities in Buildings 7 and 10 and their collapsed walls made of unburnt daub.

The oldest horizon (I) was positioned right above the natural geological formations, i. e. the sand of the Neogene Lake in Pelagonia. Two levels of buildings were identified there, consisting of 6 layers of daub, plaster and soot, i. e. the architectural deposits associated with Buildings 1 and 2 (with burnt daub) and Buildings 5, 7 and 10 (with smaller and bigger posts and unburnt daub). A massive Neolithic pit was recorded south of Building 2, but also a larger pile of stones and broken grinders next to it, which were deliberately piled up in this area. Similar to the upper ho-

²⁰ Mitkoski 2005; Temelkoski/Mitkoski 2005; Naumov *et al.* 2018a; Naumov *et al.* 2018b.

²¹ Kitanoski 1989; Kitanoski et al. 1990.

²² Naumov et al. 2018b; Naumov et al. in press.

²³ Arsovski 1997; Dumurdzanov et al. 2004.



Fig. 7: Western profile of the quadrant 17 in the excavated trench (Drawing: Aleksandar Mitkoski; Editing: Goce Naumov).

rizons, a part of this space was damaged in 1970s during extraction of sand with a bulldozer, so a direct insight into the deposits over the substratum, i. e. the sand, is not possible. White-painted pottery with distinctive decoration common for Early Neolithic in Pelagonia was found within this horizon. Its Early Neolithic date is further confirmed by the radiocarbon analyses of wheat seeds documented in Building 2, giving a range between 6000 and 5900 BC. The dating of more samples from Vrbjanska Čuka is underway, which will provide a better understanding of the chronology of the initial and subsequent phases of this settlement.

Dating of the Neolithic layers

One of the aims of the Vrbjanska Čuka research is the exact dating and its application within the already determined chronological frame of the Balkan Neolithic. With this in mind, multiple samples were taken from different contexts and horizons (charcoal, seeds and vessel fragments containing lipids suitable for dating) in order to obtain a thorough chronological sequence and temporal framework for the establishment of the Neolithic settlement up to its abandonment. Several types of samples from Vrbjanska Čuka were sent to various laboratories for radiocarbon dating in order to obtain an accurate chronology of the site. Consequently, a set of dates was provided that give the initial chronological framework of the settlement between 6000 and 5700 BC, i. e. the end of Early Neolithic in terms of Balkan chronology (Fig. 8)²⁴. Many more samples were taken from each level determined in the stratigraphy of the site that will soon be dated as well, so a solid temporal sequence and Bayesian modeling of the duration of each horizon and therefore a firm basis for the interpretation of the settlement's beginning and end will be produced.

For the first group of dates from Vrbjanska Čuka, nine samples were sent to the National Center of Accelerators at University of Seville (Spain), Laboratory for the Analysis of Radiocarbon with AMS at the University of Bern (Switzerland) and the Organic Geochemistry Unit/BRAMS at the University of Bristol (United Kingdom). Radioactive carbon isotopes (¹⁴C) were measured in order to determine the latest period of activity of organic samples. The majority of samples were cereal and pea remains sampled from the floor in Building 2 (Horizon I), considered as one of the earliest Neolithic contexts. There were few from the upper-

²⁴ Naumov *et al.* 2018b; Stojanovski *et al.* 2020a; Naumov *et al. in press.*

most Neolithic layers (seed and lipid from pottery), as well as from the final stages of the tell (human teeth and seed).

The earliest date comes from the seed sample CNA-4704, it is determined at 7036 BP with a standard deviation of ±36 years while its calibration gives a time span between 5996 and 5844 CalBC with 95.4 % probability²⁵. Nevertheless, although its temporal range is smaller than that of the previous sample, its peak still indicates the date of 5975 BC ±36 years. The next date, associated with the CNA-4703, is determined at 7030 BP with a standard deviation of ±37 years. The calibration of this date gives the range between 5999 and 5840 CalBC with 95.4 % probability and chronological peak around 5970 CalBC ±37 years. The third earliest date comes from the sample BE-8236, dated at 6995 BP with a standard deviation of ±24 years. Calibration of this date indicates calendar dates from 5981 to 5807 CalBC with a 95.4 % probability. The chronological peak of the chart suggests 5890 BC as a probable year, as well as one another smaller peak referring to 5960 BC ±24 years.

The sample CNA-4705 has a lab rate of 6976 BP \pm 36 years that is earlier than the previous sample, but its peak indicates a somewhat later date. Calibration of this sample provided two chronological frames with the one that has 95.4 % probability spanning from 5978 to 5947 CalBC. Due to two calendar ranges, its peak indicates the dates of 5960 and 5880 BC \pm 36 years. The next sample BE-8235 has a lab value of 6946 BP, with a standard deviation of \pm 44 years. This value has a calendar date between 5972 and 5732 CalBC with 95.4 % probability. According to these dates and the two chronological peaks in the chart, the analyzed seed could be dated around 5960 and 5820 BC \pm 44 years.

It should be noted that all five aforementioned samples are from Building 2 with an earliest date of around 5975 CalBC and the latest approximately 5960 or 5820 CalBC. If such dates are considered, then a household activity of 10 or 100 to 150 years in this building can be proposed. Once the Building 2 is dated, it would be possible to constrain this chronological range with the use of Bayesian modeling. Currently, the first peak of latest dates indicate activity of about 10 years in Building 2, although a longer usage of this architectural unit could be expected. On the other hand, the second peak of the same calibration point to approximately 100 years of its employment, but it is uncommon for daub buildings to be used over such a long period. Nevertheless, this building

25 Calibration was done in the OxCal 4.3 program from the Oxford Radiocarbon Acceleration Unit (Bronk Ramsey *et al.* 2013). For a more thorough review of dating processes and calibration of lab dates within Pelagonian and Balkan chronology see Naumov 2016b.

has remarkably massive walls, a number of internal daub structures, traces of renewal and big posts associated to it evidently demonstrates an intended durable workshop or house. The neighboring Building 11, as well as Building 7 and 10 above it actually reflect two phases contemporary to the use of Building 2 (see a more detailed discussion below), which already suggests that this building could have been used over a longer time than usual.

Apart from these samples, two more were taken from some of the latest layers of the Neolithic settlement at Vrbjanska Čuka. One of these samples belongs to the uppermost Neolithic horizon and it is associated with lipid remains in a shard (BRAMS 2838)²⁶. It has a date of 6839 BP and standard deviation of ±47 years. The calibration provides a combined probability with one of 95.4% sigma range that has a temporal range between 5813 and 5640 calBC. Hence, its peak indicates the date of 5725 ±47 years. The sample CNA 4705 is a pea seed and it was found in a small channel dug for the foundations of the Building 14, one of the last in the stratigraphy of the Neolithic settlement. Its deep foundations were cut through several buildings below, even reaching the Building 2. It was dated at 6824 BP with a standard deviation of ±35 years and calibrated chronological span between 5762 and 5640 calBC. The peak of this calibration indicates the date of 5720 BC ±35 years and makes it the most recent Neolithic dating of Vrbjanska Čuka so far.

According to these dates the approximate end of the Neolithic settlement could be estimated to have taken place around 5700 BC, although the samples from the few uppermost, thinner layers should be taken in order to have a more accurate determination of the final stages. In regard to the final stages of the tell itself, there are also two more dates that can contribute, but go beyond Neolithic chronology. The sample NVČC 14 indicates the years between 907 and 1119 AD, i.e. the Middle Ages, and the sample BE-8237 has the chronological range between 1959 and 1986 AD, corresponding to the time when the top of the tell was used as a farm, later for sand exploitation and finally as an excavation area.

Nevertheless, at least seven samples provide excellent information for the initial dating of the beginning and end of the Neolithic settlement. Considering the date accuracy of samples and the possible chronological extent, Horizon I of Vrbjanska Čuka can be dated around 6000 BC and Horizon III approximately at 5700 BC (Fig. 8). This refers at least to Building 2 (one of the earliest) and Building 14 (one of the latest). According to the established

²⁶ Stojanovski et al. 2020a.



Fig. 8: Chronological sequence of the dates from Vrbjanska Čuka (Calibration: Goce Naumov).

chronological frames of the Balkan Neolithic²⁷, these dates places the establishment of the settlement during the end of the Early Neolithic. This is not surprising, as similar chronological ranges were obtained for multiple Neolithic sites in Pelagonia²⁸. According to the calibration of data from radiocarbon analyses in the 1970s at labs in Austin and Zagreb, and in 2010s at labs in Seville, Bristol and Bern, many of the Neolithic settlements in Pelagonia were established and mainly active in the period corresponding to span of Vrbjanska Čuka, i. e. during first 300 years of 6th millennium BC²⁹.

Neolithic Buildings

As previously mentioned, 17 Neolithic buildings were recorded during the Vrbjanska Čuka excavations although few could belong to a single domestic unit. Given that multiple structures with evidently distinct features and potential functionalities were discovered, the team decided to name them as buildings instead of the previously used terms houses or sanctuaries. For the moment, only Buildings 1 and 2 are completely excavated and a discussion concerning these features will be provided below, while the remaining buildings will be discussed only in terms of architectonic character as they are damaged or not completely excavated.

Building 1 was excavated in the 1980s and interpreted as a sanctuary based on its interior structure, referred to as an altar (Fig. 9)³⁰. However, a reconsideration of the architectural features and their comparison with other buildings found on the site during the recent archaeological campaigns requires a more cautious interpretation of Building 1. The so-called altar could have served as a massive granary consisting of a system of lateral bins for storing and processing cereals (Fig. 20). This four-meterlong daub structure indeed has stair-like applications on the walls commonly featured in the small tablet-altars, but its use could be explained in terms of agricultural economy with an outlook that embodies the symbolic protection of groceries that were stored and processed inside³¹. Therefore, due to the absence of evidence for the ritual activities, Building 1 cannot be considered as a sanctuary, but rather a dwelling or a workshop where cereals were stored and processed for consumption. In the forthcoming field seasons, this observation will be reexamined by re-excavating what is left on site from this building, although the remaining evidence may also not be conclusive.

Building 2 also requires particular attention due to its specific features and size (Fig. 10). Similar to Building 1, it belongs to Horizon I and, so far, it is the earliest building on the site established right above the natural deposit of sand. Although it was significantly damaged by the Roman and Medieval pits and partially by sand extraction, the majority of its daub structures were still preserved. This

²⁷ Reingruber/Thissen 2016.

²⁸ Naumov 2016a; Naumov 2020.

²⁹ Srdoć et al. 1977; Valastro et al. 1977; Pazdur 1990; Naumov 2016b.

³⁰ Kitanoski et al. 1990; Mitkoski 2005.

³¹ Mitkoski/Naumov 2007.



Fig. 9: Plan of the Building 1 with the large granary and lateral bins (Drawing: Aleksandar Mitkoski; Editing: Goce Naumov).

massive 130m² building was made of thick, burned daub walls, three large posts in the middle and contains 11 clay structures including three ovens, two bins, one platform and three round plastered working areas for processing cereals, as well as approximately 30 grinding stones turned upside down (Fig. 11; 19). On its western side there are remains of a second storage with a bin which most likely fell on the oven and plastered working areas in this part of the building.

Building 2 is the largest Neolithic building in Macedonia discovered so far, also remarkable is the great number of clay structures which most likely demonstrates its function as a workshop for the processing of cereals or larger domestic unit. A quantity of wheat seeds and chaff sampled for archaeobotanical analysis and the grinding stones further corroborate such function although its role as a dwelling should not be disregarded either. There were no complete or restorable vessels and the number of pottery shards, figurines and tools is very small; which is indicative for cleaning of the building after the last stages of occupation. Such cleaning activities, the placement the grinding stones upside down and the intentional firing of the daub walls indicates a symbolic action of building abandonment which was also practiced at other Neolithic sites in the Balkans³².

Building 3 was excavated in the 1980s and, unfortunately, there is no adequate information on its strati-

³² Gheorghiu 2007; Fidanoski 2015.



Fig. 10: Disposition of several Neolithic buildings outlined in color and with indicated interior daub structures (ovens, bins, grinding areas) in some of them: Building 2 (red), Building 4 (brown) Building 5 (black), Building 6 (green), Building 11 (orange), Building 14 (blue), pit-dwelling? (yellow) (Photo: Hristijan Talevski; Editing: Goce Naumov).

graphic position and the interior layout³³. Building 4 belongs to Horizon II and was discovered during the current fieldwork. It is consisted of massive daub walls and several bins, granaries and a small oven (Fig. 10). It is not yet completely excavated, and it was significantly damaged by the Roman and Medieval pits, so it therefore

cannot be thoroughly described at this stage. Nevertheless, it has similar features to that of Buildings 1 and 2 despite other buildings which do not have burned daub walls or interior clay structures discovered so far. In terms of the other buildings, it should be asserted that only small parts of them were excavated or they were only recorded in the stratigraphic sections. Building 5 is on the same level and to the south of Building 2, but apart from posts, it does not have the remains of daub or other structures. Therefore, it

33 Mitkoski 2005.





Fig. 11: Daub structures for processing of cereals and preparation of food in Building 2: a) Oven 47 with small bin and oval grinding area; b) Oven 322 with a processing platform, small bin and remains of upper floor with double bin fallen on the oven, as well as the foundation of a channel from the Building 14 that cut and damaged the oven (Photo: Goce Naumov).

As evidenced in the archaeological records from the

Vrbjanska Čuka excavation, the firing of buildings was an

isolated practice in different stages of the settlement. Re-

is not evident whether it is a lateral compartment to Building 2 or whether it functioned as an individual structure made only of dry daub which was found within its area. The same character can be attributed to Building 11, which is on the same level as Building 2 and 5, but was built from dry daub with thick layer of plaster as a floor or fundament above the natural deposit of sand.

Right above Building 11, the Buildings 7 and 10 were established and they presented similar architectural features. Buildings 7 and 10 were damaged by later pits, but also by the posts in the burned massive daub walls of Building 4 that was established on top of them. The buildings right above Building 4 also consist of burned daub walls and plastered floor, such as Buildings 6, 9 and 12. Building 14 belongs to Horizon II and it is built above the aforementioned Building 4, but it is also different from all buildings below due to employment of channeled quadrangular foundations where the posts were dug (Fig. 10). The thin layers above it belong to Buildings 8 and 16, which reverted to earlier practices of walls made of dry daub and plastered floor. Building 15 is still dubious as it is not clear whether it belonged to a pit dwelling contemporary to Building 4 or it was a different structure significantly damaged by a large Medieval pit.

In sum, there were approximately 17 buildings recorded at Vrbjanska Čuka, of which few could be part of one unit. Although all of them were made of posts covered with clay, they differ in terms of later treatment of their walls. Namely, the majority have dry daub walls, but several (such as Building 2 and 4) consisted of heavily burnt daub walls. For some time, such walls were considered as a result of unintentional fire, but more recently a number of studies proposed deliberate burning of Neolithic houses³⁴. The same could be suggested in the case of Vrbjanska Čuka, as there are several arguments in favor of this interpretation. The color of the daub indicates that the walls were exposed to long and intense burning which would not have happened in the case of unintentional fire due to the halt of its spreading. Also, the contemporary buildings next to Building 2 did not have any traces of burning which means that its firing was controlled and solely restricted to this structure. If the cleaning of this building and the placing the grinding stones upside down are also considered a practice of symbolic finalization of the house life, this could be proposed as for other Neolithic buildings in Macedonia and in the Balkans in general³⁵.

ferring to the stratigraphy of the site, it should be asserted that there is establishment of at least six buildings one on top of another. Consequently, due to this type of disposition of buildings and their distinct construction, a division of layers in three horizons is proposed solely based on architectural features and not on the material culture. In the first level of Horizon I, there were four buildings recorded right above the natural sand deposit, such as Buildings 1, 2, 5 and 11, whereas on the next level of the same horizon Building 7 and 10 were recorded. The next Horizon II is represented by Buildings 4 and 15 (Building 15 could be the remains of a pit dwelling) in the first level and Buildings 6, 9 and 12 constructed above, representing the next level. Horizon III represents the last stage of the Neolithic settlement, when Building 14 with channeled foundations was erected and with Buildings 8 and 16 from the level above as the final architectural activity in the Neolithic settlement. It should be asserted as well that there are no sedi-

ments of natural deposit between any of the buildings mentioned above. This means that the buildings were constructed in a short temporal range without larger interruptions of household activities in this particular area of the excavation trench. After the abandonment of earlier buildings, new buildings were established on top with the only preparation consisting in the leveling of the remains and placing a plaster of whiteish clay above. For the moment, there are no dates for each of the recorded buildings which would enable the comprehension of the occupation period of each particular structure and the temporal dynamics of rebuilding new ones. Nevertheless, the dates from Building 2 as well as the dating of selected samples from the remaining ones will provide information on a time when these structures were established, used and abandoned.

Architectural materials

During the 2018 season at Vrbjanska Čuka, a program of studying the burnt daub found on site was initiated, the preliminary results of which are presented here. A total of 728 pieces of daub were recorded so far, most of them from the collapse of Building 2. The study is focused on daub shapes and impressions of vegetal materials and aims to reconstruct details of the construction of walls, roofs and installations that are not otherwise preserved in the archaeological record. The recording methodology used here was created using previous shape-focused daub

³⁴ Stefanović 1997; Chapman 2000; Tringham 2005; Gheorghiu 2007; Naumov 2013.35 Fidanoski 2015.

studies as a basis³⁶. Most of the collected pieces probably belonged to walls since they feature flat surfaces with impressions of parallel rounded pieces of wood on the back. On a majority of daub pieces, presumably belonging to the outer walls of buildings, the thickness of the daub layer that was applied onto the wooden framework ranged between 5-8 cm. Assuming that a daub layer of equal thickness was applied on the other side of the wooden framework, and observing that the wood impressions on the back of the daub pieces in question seem to indicate wooden stakes with 7-9 cm diameter, the typical thickness of building walls can preliminarily be described as ranging from 17–25 cm. Some recorded pieces show much thinner daub layers on wood (< 2 cm); these thin walls might belong to internal walls or installations rather than outer walls. Some wall fragments carried plaster.

Other daub pieces featured wood impressions that attested to complex arrangements of wooden components and might belong to building corners, installations or the roof. The impressions in the Vrbjanska Čuka daub attest to the use of wooden components of very different sizes in building construction. Where impressions are preserved well enough to have preserved the complete diameter of wooden pieces, these diameters range from 0.5 cm to 8.8 cm. However, much larger pieces were probably used without their impressions being completely preserved in daub. Most wood impressions were round, but a few were angled and attest to the splitting of wood pieces prior to their use in construction. Daub pieces that represent corners or edges display a wide variety of shapes from rounded to sharp corners which attests to the careful preparation of architectural components with different visual qualities at Vrbjanska Čuka.

Most pieces of daub show very similar inorganic inclusions: frequent inclusions of very small, glittering particles that probably represent mica; moderate amounts of very small (>3mm) stones, most of them white, but some gray or black; and in few cases larger stones. The homogeneity of the inorganic inclusions shows that probably all studied daub pieces were made from the same clay source and/or had the same inorganic temper added. Botanical inclusions in daub represent a very interesting field of study. The Vrbjanska Čuka daub preserves traces of botanical inclusions mostly in form of voids, but in some cases the actual inclusions themselves were still preserved. The impressions are mostly of the stems of cereals or similar plants, although occasional grain impressions were also observed including a few entire wheat ears (e.g. Fig. 12). This shows that it likely was the leftovers of grain process-



Fig. 12: Impression of a wheat ear and botanic macro-remains preserved in a piece of daub (Photo: Jana Anvari).

ing (chaff) that were added to the daub as temper. A future and more detailed study of the impressions and macro-remains using microscopes might, however, be able to establish in greater detail what plants and what sections of plants were used – including also the wood impressions.

Material culture

Neolithic sites in Pelagonia are commonly rich in finds made of clay, stone, flint and bone. The same could be confirmed for Vrbjanska Čuka as well, particularly after the detailed documentation of all finds and the analysis performed on some of them. The study of finds provides an insight into the economy and everyday life of the farming community inhabiting this tell, but also sheds more light on some of the social and symbolic components of vessels, figurines, models, altars, weights, sling shots, blades/ sickles, axes and needles produced and employed by the residents of the daub buildings. Considering the diversity of forms and types in each category of finds, it is clear that the community that inhabited Vrbjanska Čuka invested significant amounts of time and skill into the production of refined and representative objects beyond the requirements of their function.

Unlike ceramic finds, the number of artefacts made from stone and bone is far smaller. They belong to a category of tools used for cutting, slicing and drilling. Most

³⁶ especially Jongsma 1997; also see Chetwin 2007; Sherard 2009.

common in this group are the stone axes of different dimensions and with well preserved edges, whereas only a few have bore-drilled openings for the insertion of a handle. The number of animal bones is surprisingly small (Tab. 3), which is also reflected in the quantity of tools made of this material, such as the spikes, needles and chisels found in the initial horizon. The flint tools are also present and were part of a closer analysis, discussed in detail below.

Finds made of clay

As on many archaeological sites the potshards are the most frequent ceramic finds, produced with high quality for Neolithic standards, so consequently a large number of them featured fine fabric. Such a concentration of vessels made from fine clay with a polished surface is not common for many other sites out of Pelagonia. However, despite the frequency of these vessels, their typology does not vary to a significant degree. Three basic types of vessels with fine fabric can be differentiated, such as dishes, pots and jars with high neck (Fig. 13). They were found in all horizons and in many contexts. Therefore, they are not to be distinguished as a reference for a stratigraphic definition of the settlement vet. A much more detailed study of vessels and the entire ceramic assemblage is necessary in order to define the social changes within the settlement, although an initial analysis of their typology and contents in their interior was already done³⁷.

Pots and dishes dominate among the vessels with fine fabric. Pots are mostly of medium and smaller dimensions and are found in many colors: dark red, ocher, beige, brown, gray and black. Almost all colors were found in the three horizons, although the variations of red color are most frequent in all horizons. Red and black pottery is equally found even in Horizon I, i.e. the Early Neolithic, which contradicts the common consideration of black polished pottery as a feature of the Late Neolithic³⁸. They were made of fine clay without any silicate or organic additives, color-coated and fired at a high temperature and polished afterwards so that high gloss could be achieved. Black pots have no decoration, but nipple-like applications on the slightly carinated parts. A significant quantity of carinated vessels were detected in Horizon III, so it could be considered as a later appearance, which is yet to be confirmed with a more thorough study.

38 Simoska/Sanev 1976; Garašanin 1979; Sanev 1994.

Red-colored pots were more decorated, so in addition to the nipple-like application on the most prominent part of the vessel, they also have white and black painted patterns. White painted patterns are rare but were found in the earliest lavers of Horizon I and in the Horizon III as well. Such painting was evidently present throughout the entire period of the settlement's existence and was synchronously applied along black painted pattern on other vessels. Often, thin, white stripes and triangles were present, most probably part of the usual elongated patterns typical of Velušina-Porodin Culture in Pelagonia³⁹. Black-painted patterns occurred in most of the pots entirely covered with a red color, but its composition cannot be determined due to the fragmentation of vessels. Usually, they were massive or consisted of thin vertical, horizontal and diagonal stripes, as well as zigzag lines which were not firmly fixed on the pottery during the painting and therefore remained pale, sometimes even hardly noticeable. They were also found in all three horizons, and consequently cannot be considered as a diagnostic feature of a specific phase of the settlement. Unlike the Amzabegovo-Vršnik group, where black painting was mainly employed during the Middle Neolithic, in Pelagonia this color was used even in the Early Neolithic⁴⁰.

Apart from pots, jars with elongated necks were also found among those with a fine fabric. They were made of fine clay in brown, beige and gray colors and are mainly found in Horizon I and Horizon III. Furthermore, several legs were found from three- or four-legged vessels of fine fabric, otherwise rarely present in Pelagonia. It should be emphasized that they were not rhyta, but representative vessels used for food or liquids. Only spare legs of such vessels were recorded in multiple contexts (mainly in Horizon III), so their full appearance cannot be reconstructed.

Vessels with coarse fabric were presumably used for storage, while those with extra-large dimensions are rarely found. More frequent were the medium sized vessels, which could have been used for the transport of liquids and crops. They were made of relatively fine clay, but occasionally organic inclusions are found, such as straw. Their surface is not polished like on the vessels with fine fabric and most often their color is beige and reddish. Especially frequent are the amphora-like vessels, but there are also askoi, though in highly fragmented condition. They were found in Horizon II, but certain fragments suggest to their presence in Horizon I as well. Apart from these vessels,

³⁷ Mitkoski 2005; Temelkoski/Mitksoski 2005; Naumov *et al.* 2018a; Naumov *et al.* 2018b; Stojanovski *et al.* 2020a.

³⁹ Simoska/Sanev 1975; Simoska/Sanev 1976.

⁴⁰ Grbić et al. 1960; Gimbutas 1974; Sanev 1995; Naumov 2015.



Fig. 13: Several types of Neolithic pottery common for Vrbjanska Čuka (Photo: Aleksandar Mitkoski).

there are entirely preserved vessels of smaller size whose function is hardly determinable at this stage of research.

As for the vessels with a coarser fabric, their decoration was often made by pinching and barbotine, present from Horizon I onwards, but is not as frequent as in Neolithic sites elsewhere in Macedonia. Pinching was sometimes used for producing triangular shapes, while nail embossing, although seldom, was present on the applied bands. Other types of applied bands often have impressions typical for the Neolithic vessels in the Balkans and they were rarely modeled in a zigzag line. Moreover, there are also bands, i.e. more massive clay ribs inside the vessels which served for holding strainers. Button-like applications were also present, which is a common feature in the broader region. The incision is one of the more frequent decorative techniques in vessels with a coarse fabric. This technique was used for diagonal, vertical or horizontal lines, but also for concentric circles and rhombuses. Some vessels even have bottoms with impressions which were not a part of the decoration, but a negative of the straw mat on which they were laid prior to firing or while drying.

So far in Vrbjanska Čuka, 24 base fragments from ceramic vessels with preserved negative imprints of a textile were documented although similar marks were recorded on the anthropomorphic house models, altars and daub as well. One technique of weaving is identified, a double weft twining with two variants, such as the tight simple S-twist twining where the rows of the wefts are tightly packed (recorded on 20 bottoms). Also, the closed simple S-twist twining is documented where the rows are slightly separated (evidenced on four bottoms), as well as a simple S-twist twining where the warps are slightly separated (evidenced on one bottom). The imprints are always on the outside of the vessel base, which indicate that the textile most likely originated from a ragged cloth or blanket used either to protect the pottery from contamination by dirt while drying, or as a support while raising the vessel⁴¹. These textile imprints on pottery from Vrbjanska Čuka demonstrate that a developed phase of the textile industry had been present in this settlement since the Early Neolithic. There is still no information for the material used in producing the textile, since flax has not vet been found at the site, but nettle (Urtica dioica) has been identified in the archaeobotanical record.

Among ceramic objects, those of symbolic character stand out, such as figurines, anthropomorphic house models and tablet-altars. Most often, figurines depict people or cattle and are more frequent in Horizon III compared to the first two horizons, where they have rarely been found so far. Anthropomorphic figurines are usually columnar, with emphasized stylization, i.e. the absence of limbs and a face (Fig. 14). In some cases, the arms are only indicated and body-tight, whereas the face sometimes consist solely of applied eyes. Some figurines of such typology have pronounced thighs and plate-like applications over the genitalia or the waist which is common for such objects in Pelagonia⁴². Animal figurines are rare, and the cattle representations are the only ones that could be determined so far. Two examples stand out among animal figurines: one with a recipient on its back and the other with applied zigzag leg patterns. Both contain elements typical of altars, so visually and functionally they belong to both categories of objects.

Altars (also known as tablets) are frequently present from the initial horizon onwards and bear the usual characteristics for such objects, like legs with zigzag application and a recipients braided with an applied ribbon, sometimes consisting of carved lines (Fig. 14). Their size is smaller, while their color is usually creamy and rarely reddish-brown. The fragments of anthropomorphic house models should be considered in the same manner. These models were found in all Neolithic horizons and bear the typical features, even though they are fragments only from the cube and rarely the cylinder. Most of them were rectangular cubes with big openings, typical for the northern parts of Pelagonia, but there were also some bearing the same zigzag applications at the lateral apertures as the altars⁴³. In addition to the cubes, several cylinders with central openings on the top and traces from burning, i.e. from smoke that exited from the opening, were also recorded. The dimensions of these finds are relatively large, their color is usually creamy and brown, the fabric is intermediate, without additives of organic and mineral temper. None of the cylinders found so far have distinct face representation, although their fragmentation should be considered, as well as the rare presence of these elements in the northern parts of Pelagonia.

Among the small clay objects particularly interesting are the so-called labrets and the small conical objects made of clay resembling stamps, but without carved or applied patterns that should be impressed on a soft surface. They are assumed to have been tokens or calculi, i.e. objects used in games, economy, rites etc.⁴⁴. Similar to these are the flat tokens which could have had the same purpose. In this regard, also worth noting are the smaller or bigger discs made of vessel fragments and perforated in the center. They were most probably used for spinning, as loom weights or for fishing nets. Clay was also used in the production of bracelets and for modeling of the so-called bread models. The clay sling shots are also common in Vrbjanska Čuka and they have smaller dimensions, an ellipsoidal shape, as well as a red or brownish color due to firing. Their presence is quite frequent compared to the other regions in Macedonia where they are completely absent or extremely rare⁴⁵. The last among ceramic objects are the massive finds of conical and rectangular shape and their function is unclear. They are thought to be vessel plugs, bases or objects that have symbolic features.

Use-wear analysis of lithic tools

The use-wear analysis was mainly focused on the study of the so-called glossy blades, their morphological, techno-

⁴¹ Mazăre 2012: 39; Özdemir 2007: 74.

⁴² Simoska/Sanev 1976; Naumov 2016a; Naumov 2020.

⁴³ Temelkoski/Mitkoski 2005; Naumov 2016a.

⁴⁴ Nilhamn 2002; Bennison-Chapman 2019.

⁴⁵ Simoska/Sanev 1976; Kitanoski 1977; Simoska *et al.* 1979; Naumov/Tomaž 2015.



Fig. 14: Figurines, anthropomorphic house model and altar-tablets typical for Vrbjanska Čuka (Photo: Aleksandar Mitkoski).

logical, and functional variability⁴⁶. The sample of materials analyzed in this study amounts to 47 items. All of them were subjected to macro- and microscopic observation in order to highlight the potentially used edges. A more detailed analysis of the use-wear traces has been carried out only for tools used in cereal harvesting (Fig. 15). The

46 Gibaja et al. 2017; Mazzucco et al. 2017.

standard use-wear methodology has been used for their analysis, integrating both a macro- (magnifications between 5x-40x) and a microscopic scale of analysis (magnifications between 50x-400x). As result of the analysis, 18 glossy blades have been detected. Of them, three tools show two active edges, while one tool shows up to three used edges; therefore, a total of 23 edges used have been recognized.



Fig. 15: Flint tools and microscopic images with trace of use-wear (Photo: Niccolo Mazzucco and Juan F. Gibaja).

Blade blanks prevail (n=15), while only three flakes were used to produce harvesting inserts. Tools were made of at least four different varieties of chert: 1) a honey colored, massive, fine-grained chert; 2) a gray-colored, massive, fine-grained chert; 3) a dark, black- to gravcolored chert, occasionally with reddish tonalities, characterized by a coarser texture than the previously mentioned chert-types; 4) a gray-colored, medium-grained chert, characterized by abundant calcareous inclusions. This classification has been made on the basis of the first macroscopic observation of the material and should be taken as preliminary. Still, for being such a small sample, the diversity of raw-materials exploited is quite high, suggesting that different strategies of lithic raw-material acquisition and reduction were undertaken by Vrbjanska Čuka groups.

The average dimensions of the inserts are between 40–30 mm in length, 15–20 mm in width and 4–5 mm thickness. All of them have been made on blade or flake

fragments, voluntarily broken before the use. Inserts were likely produced through different methods. Blades on fine-grained cherts were flaked by pressure, given their extreme regularity, while inserts on less homogeneous raw materials were probably flaked through other techniques. However, a larger sample of artefacts it is necessary to explore more in detail for techno-economic issues.

All analyzed inserts highlighted the presence of diagonally distributed glossy surfaces. This type of use-wear is produced when the inserts are hafted into curved sickles to form serrated cutting-edges. From a microscopic view, traces show the typical pitted and striated polish produced by cereal harvesting. Despite that, variations in the quantity of striations and abrasions on the lithic surfaces can be highlighted from one insert to another, suggesting variations in the harvesting motion and gesture. Cereal glossis are generally well-developed, indicating a very prolonged utilization of the inserts, for dozens of hours of harvesting. In addition, of the 23 used edges, 14 edges have been

Sample code	Quadrant	Stratigraphic Unit	Volume (L.)	Unit description	Horizon
VC19_S_05	25	461	6	latest Neolithic layer in q. 25	
VC19_S_06	24	463	9	latest Neolithic layer in q. 24	III
VC19_S_10	25	486	12	burnt area bellow dry daub from building above Building 2	II
VC19_S_11	32	490	2.5	pit in the burnt area 486 bellow the dry daub above Building 2	II
VC19_S_12	25	479	4	plaster from building right bellow the latest Neolithic layer (463)	Ш
VC19_S_13	16	488	12	level below plaster 479, bellow the upper most Neolithic layer (463)	Ш
VC19_S_15	25	521	0.6	in situ burnt post in-between north wall of Building 2 and Bin 501	I
VC19_S_17	24	519	1	Post hole south from a group of posts from Bulding 16	Ш
VC19_S_18	26	325	1.1	easternmost post hole from a cluster of post holes in north wall of Building 2, there is also a burnt area next to it and two oval bins for processing cereals (270 and 271)	I
VC19_S_21	16	520	2	post hole in Building 10, the third earliest building	I
VC19_S_27	26	525	0.7	Burnt area around oven 322	I
VC19_S_40	16	508	1.8	test pit/section in quadrant 16; burnt thin sediment on the floor of Building 4	II
VC19_S_41	25	503	0.08	plaster from one of the uppermost buildings = 9	Ш

Tab. 2: List of samples taken in 2019 and included in this paper.

retouched in order to prolong their cutting effectiveness. This data points out toward a strong exploitation of the available edges.

In conclusion, Neolithic groups at Vrbjanska Čuka were using sickles with serrated cutting-edge to harvest cereals. This type of harvesting tool is quite common in the Central and Eastern Mediterranean, even if regional differences in the size and the type of used inserts can be highlighted. Future analysis will provide more detailed insight into the Vrbjanska Čuka lithic assemblage, integrating these results into a broader perspective.

Archaeobotanical analysis

Archaeobotanical research at Vrbjanska Čuka started in 2016, but the data generated until 2018 (including botanical macro- and microremains) is still under analysis⁴⁷, and we will focus on the results obtained in the last field campaign⁴⁸. During the 2019 campaign at Vrbjanska Čuka, a total number of 43 samples were retrieved from different deposits and buildings. Twenty samples were sieved, with a total amount of almost 95 liters of sediment, but the focus will be on the 13 samples that have been completely analysed so far, which adds up to the amount of 52.2 liters of sediment (Tab. 2). The wash-over technique was used in order to recover the maximum number of plantmacroremains possible⁴⁹. No pre-treatment was necessary to apply other than soaking the sediment before sieving. One of the field stations of the IPAS (Institute for Prehistory and Archaeological Science) was used.

A considerable number of plant remains (almost 2500 remains) was recovered in the analysed samples. The large majority belongs to crop remains (cereal chaff, in particular), but also considerable amounts of herbaceous and other wild plants were encountered. Up to 35 taxa have been identified in the preliminary work done during the 2019 fieldwork campaign. The majority of remains are found in a charred state, but some mineralised remains were also recovered. At this moment it is unclear if these mineralised remains are Neolithic, since they were predominantly found in the uppermost layers and they may be contaminations from later Roman or Medieval deposits, as was suggested in the previous studies which regarded charred remains recovered from contexts excavated in 2016⁵⁰.

The samples presented varied densities of remains per litre (r/L) of sediment, from below 2 r/L to almost 1000

⁴⁷ Beneš et al. 2018.

⁴⁸ Antolin et al.2020.

⁴⁹ Kenward et al. 1980; Steiner et al. 2015.

⁵⁰ Beneš et al. 2018.

r/L (Fig. 16). No mass finds were identified. Among the samples with densities above 100 r/L, we could observe two different groups: one quantitatively dominated by chaff remains and the other one dominated by weeds (and chaff). One sample shows values of medium densities (ca. 80 r/L), with a mixture of grain and chaff remains. The samples with lower density values (below 20 r/L) were of mixed composition, some with more grain and chaff or chaff and weeds. There is no spatial patterning visible at the moment, each sample showing a different composition, which suggests a reasonably low post-depositional affectation of the samples.

Among the cultivated plants, several cereal and legume species have been identified. Among the cereals, einkorn (Triticum monococcum) is the best-represented taxon, with some finds of the 2-grained type. There are also grains and chaff remains of emmer (Triticum dicoccon) and a few of barley (Hordeum vulgare), including naked and hulled forms. Among the pulses, pea (Pisum sativum) is the best represented crop, but additional single finds of lentil (Lens culinaris) and possibly bitter vetch (cf. Vicia ervilia) have occurred. Potential cereal-based food remains were recovered, particularly in the area around the oven SU 322, which will require further investigation. Additionally, wild edible plants were also recovered, such as sloe (Prunus spinosa), bramble (Rubus fruticosus) or elderberry (Sambucus nigra), as well as fat-hen (Chenopodium album). Some interesting wild plants, indicative of wetlands nearby the site have also been identified at a preliminary level, such as Scirpus lacustris, cf. Eleocharis sp., or Lycopus europaeus. Among the potential weeds, ruderals and grassland plants we can highlight the presence of Bromus sp., Chenopodium album, Verbena officinalis, Polygonum aviculare, Urtica dioica, Melilotus sp., Rumex acetosa, Plantago lanceolata and Galium sp.

The cereals were mostly represented as chaff remains (Fig. 16). Einkorn dominated in most samples, where emmer was also well-represented. Barley was present in several samples, but always in small amounts. Grains also show a similar trend, with more remains of einkorn, followed by equal number of finds of barley and emmer. All of the mentioned cereal species were found in most of the samples and phases. This suggests a considerably diverse crop spectrum that is in accordance with the available data from nearby regions⁵¹, but there seems to be a clear focus on einkorn at Vrbjanska Čuka.

Gathered plants were also found, particularly in burnt layers associated with other food consumption residues, but mostly in small numbers, which is common in dry sites where wild edible plant foods are normally underrepresented⁵². Their presence, even when in small numbers, must be considered as an indicator of their importance as a food resource. The remarkable preservation conditions, together with a more thorough taphonomic analysis will allow us to further define activity areas, to understand refuse management and better characterize plant economy at this important site.

Archaeozoological analysis

The archaeozoological analysis provided insight into animal husbandry strategies on the basis of the taxonomic composition and reconstructed mortality profiles of domestic mammals, the use of additional dietary sources (freshwater mussels, wild game and fish), and patterns of food waste deposition within the Neolithic settlement. Moreover, the analysis of minute and porous remains of micromammals and non-mammal fauna, whose collection was enabled by flotation, enabled a better understanding of the past environment of the site. The total number of identified specimens (NISP) in the assemblage collected in 2016–2018 by hand and flotation is 1052 (Tab. 3). The vast majority (649, i.e. 61.7%) originated from large mammals, and mollusc shells were also present in fairly large numbers (203, i.e. 19.3%). The remains of other taxa - micromammals, birds, amphibians, reptiles and fish were fewer in number, given that only selected sediment samples were given to flotation.

Mammal remains are indicative of a predominantly stockbreeding economy, as bones of domestic animals (sheep *Ovis aries*, goat *Capra hircus*, cattle *Bos taurus* and pig *Sus domesticus*) dominate the sample. More precisely, they constitute 95.1% of all large mammal remains identified to the level of species or genus. The high percentage of cattle bones is a fairly uncommon feature compared to other Neolithic assemblages in Macedonia and in the Southern Balkans in general, where caprines are usually most frequent, or even represent an overwhelming majority⁵³. Nonetheless, the archaeozoological record from Vrbjanska Čuka might be best explained as an outcome of a mixed herding strategy, which included caprines, a high proportion of cattle (especially significant if the meat yield

⁵¹ Allen/Gjipali 2014; Marinova 2017; Marinova et al. 2016.

⁵² Antolín and Jacomet 2015; Jacomet et al. 1989.

⁵³ Bökönyi 1976; Schwartz 1976; Lasota Moskalewska 1985a; Lasota Moskalewska 1985b; Lasota Moskalewska/Sanev 1989; Ivkovska 2009; Manning *et al.* 2013.



Fig. 16: Results of the archaeobotanical analysis. A: density of remains per litre, taxa presented according to ecological groups. B: proportions of the main cereal crops per sample. Pictures from top to bottom, left to right: *Chenopodium album, Lycopuseuropaeus, Hordeum vulgare* s. l. (grain), *H. vulgares*. l. (rachis segment), *Triticum dicoccon* (glume bases), *T. dicoc*. (grain), *Triticum monococcum* 2-grained type (grain), *T. monoc*. (glume bases), *T. monoc*. (spikelet fork). (Photo and graphs: Ferran Antolin and Raül Soteras).

is taken into account), and, to a lesser extent, pig. The only other domestic animal present on site was the dog, and the negligible amount of their remains (NISP = 2) is a common feature observed in other Neolithic assemblages in Macedonia and in the Balkans in general.

Tab. 3: The taxonomic composition of the faunal assemblage from Vrbjanska Čuka, collected by hand and flotation in 2016–2018.

TAXON		NISP
Mammalia	Canis familiaris dog	2
	Vulpes vulpes fox	4
	Sus domesticus pig	48
	<i>Sus</i> sp.	3
	Cervus elaphus red deer	4
	Capreolus capreolus roe deer	1
	Bos taurus cattle	88
	<i>Bos</i> sp.	2
	Ovis aries sheep	48
	Capra hircus goat	9
	Ovis/Capra	98
	Ovis/Capra/Capreolus	1
	Bovidae indet.	1
	Ruminantia indet.	2
	Mammalia indet.	338
	TOTAL	649
Micromammalia	<i>Talpa europaea</i> European mole	1
	Insectivora indet.	4
	Spalax leucodon lesser mole-rat	1
	Arvicola terrestris European water vole	1
	Microtinae indet.	12
	Mus musculus house mouse	3
	Muridae indet.	5
	Rodentia indet.	3
Aves	Aves indet.	20
Herpetofauna	Anura indet.	15
	Lacerta viridis European green lizard	3
	Herpetofauna indet.	77
Pisces	Cyprinidae indet.	34
	Salmonidae indet.	9
	Pisces indet.	12
Mollusca	Unio crassus thick shelled river mussel	177
	<i>Unio</i> sp.	23
	Anodonta sp.	3

It was possible to determine the individual age of economically important domestic animals only in a limited number of specimens, therefore detailed mortality profiles could not be constructed. Nevertheless, they provide at least the basic information on the age structure of slaughtered animals. The individual age was estimated on mandibles and lower teeth (Fig. 17), on the basis of criteria for dental development and wear stages proposed by several authors⁵⁴. The age structure of domestic animals suggests that they were often slaughtered at a young age, which is probably related to meat exploitation and, in case of ruminants, at least to some extent to milk exploitation, as dairy fats were detected in one pottery vessel from Vrbjanska Čuka⁵⁵. Young animals were particularly well-represented in the pig faunal sample, whereas in case of sheep and goat, some individuals were kept alive long after reaching sexual maturity. One sheep mandible and one goat mandible displayed irregular teeth wear, i. e. deformations as a result of illness, which is indicative of certain difficulties in stockbreeding and their consequences for animal health.

In terms of contextual provenance, the majority of remains of domestic animals originated from buildings and surrounding areas, and the body part distribution, fragmentation pattern and observed butchery marks suggest that they predominantly represent food waste. A particularly large amount of bones had been found in association with Building 2 (either within the building or in its immediate vicinity), as well as within and outside of Building 4. Few elements were articulated, apart from a radius and ulna of a pig from Building 2, a sheep calcaneus and astragalus found within the daub layer of this building, and a sheep metapodial bone and phalanx I found in a post-hole. Given that a significant amount of bones had been covered with a carbonate crust, butchery marks could have been observed only on a limited number of elements - a distal part of a cattle humerus with several cuts on the medial and lateral side, indicative of dismembering, found outside of Building 2⁵⁶, and a cattle astragalus with butchery marks on the distal condylus, found in the topmost Neolithic layer. In addition, anthropogenic modifications other than butchery were observed on a sheep cranial fragment found next to the oven in Building 2 and a sheep scapula found in a Neolithic pit next to Building 2. The cranial fragment bore a 5 mm wide perforation on the temporal bone, whereas the scapula blade had also been perforated. It is also worth noting that caprovine tibiae were commonly used as raw material for making a specific kind of tool with a recipient, often interpreted as a "spatula-chisel" and two such artefacts (both carbonized) have been found at Vrbjanska Čuka⁵⁷.

⁵⁴ Matschke 1967; Silver 1969; Bull/Payne 1982; Grant 1982; Habermehl 1985; Hambleton 1999; Halstead et *al.* 2002; Payne 1985; Carter/ Magnell 2007; Vigne/Helmer 2007; Gillis 2012.

⁵⁵ Stojanovski *et al*.2020a.

⁵⁶ Naumov et al. 2018b, Fig. 14.1.

⁵⁷ Ibid. Fig. 14.2b.



Fig. 17: Mandibles of domestic animals: 1) left mandible of a calf (*Bos taurus*) with milk molars and the first permanent molar in the process of eruption, aged 3–6 months (Sq. 18, Context 166, the compact sediment above Building 4); right mandible of a very old (8–10 years) sheep (*Ovis aries*), with significantly worn premolars and molars (p3–m3) (Sq. 17, Context 166, the compact sediment above Building 4); 3) right mandible of a newborn piglet (*Sus domesticus*) with milk molars in the process of eruption (Sq. 27, Building 2). (Photo: Ivana Živaljević).

Although fairly modest in comparison to the ratio of domestic animals, the presence of wild animal remains is indicative that hunting also took place (Tab. 3), most likely in the forests on the mountain slopes bordering Pelagonia. Sporadic finds of red deer (*Cervus elaphus*) and roe deer (*Capreolus capreolus*) bones show that these animals were occasionally hunted for food. In addition, one red deer tine fragment from the upper daub layer in Building 2 bore zig-zag cut traces (probably manufacture waste), which suggests that antler was also used as raw material. Apart from game animals, several fox (*Vulpes vulpes*) bones were also identified. These animals were possibly hunted for fur.

In addition to mammal remains, a significant part of the faunal assemblage consisted of freshwater shells. Their presence is an indicator of the past wetland environment of Pelagonia given that, prior to the establishment of irrigation systems in the 1960s, there was a number of small rivers, marshes and small lakes in the area⁵⁸. At Vrbjanska Čuka, the thick-shelled river mussels *Unio crassus* of various sizes were most commonly collected, and occasionally *Anodonta* sp (Tab. 3). Particularly significant amounts of *Unio* shells have been discovered in Building 2. They were probably used for food (and possibly as fishing bait), given that a number of them (mainly larger specimens) were broken on the anterior or the posterior part of the valve. It is of particular interest to note that traces of

⁵⁸ Trifunovski 1998; Naumov 2016a; Naumov et al. 2018b; 2020.

shell nacre (mother of pearl) were observed under a binocular microscope on the surface and especially the edge of an axe found in a large post-hole; such tools were most likely used for opening bivalve molluscs⁵⁹. Similar shell breakage patterns have been observed on *Unio* specimens from several prehistoric sites in Serbia: at the Mesolithic site of Kula and the Early Neolithic site of Drenovac⁶⁰. In Macedonia, *Unio* sp. shells have been found at the Early Neolithic site of Tumba Madžari, however in modest amounts⁶¹.

As previously noted, the flotation of selected sediment samples enabled the collection of taxa of small body size micromammals, birds, amphibians and reptiles, and fish; only the fish could be unequivocally associated with human consumption. As previously noted, the former, wetland landscape certainly provided ample opportunities for fishing. At present, the major rivers in Pelagonia and Mariovo are the Crna Reka (prior to regulation, abundant in fish fauna), Dragor, Bošava and Došnica. All of them are lowland rivers populated by cyprinid species (i.e. the family of carps and minnows), apart from the upper reaches of Dragor, which represent a salmonid zone⁶². The remains of representatives of these two families - i.e. small-bodied cyprinids and salmonids - have been identified in the faunal sample from Vrbjanska Čuka (Tab. 3). Nevertheless, fishing seems to have been of lesser importance in comparison to stockbreeding and shellfish collection, possibly a supplementary or opportunistic activity. In addition, the bird remains from Vrbjanska Čuka could have also been deposited as a result of human agency, i.e. they could be indicative of fowling.

The remains of other taxa collected by flotation were not deposited by humans, but represent species which inhabited the wider surroundings of Vrbjanska Čuka or the settlement itself. Concerning micromammals (Tab. 3), the remains of two burrowing species were identified – the European mole (*Talpa europea*) and the lesser mole-rat (*Spalax leucodon*), and one semi-aquatic species – the European water vole (*Arvicola terrestris*). Whereas the presence of these species provides important data on the past environment of the site, unrelated to human activity, the house mouse (*Mus musculus*), whose remains were also identified, was an "uninvited guest" in agricultural settlements. However, so far, there has been little evidence of this commensal species in Neolithic settlements in the Balkans. House mouse remains have been documented so far at the Late Neolithic site of Vinča in Serbia and the Chalcolithic tell of Bucşani La Podin in Romania⁶³. Consequently, to the best of our knowledge, the remains of house mouse from Vrbjanska Čuka represent the first evidence of the occurrence of this species in the Balkans in the Early Neolithic.

Finally, the remains of amphibians (the frog *Anura* indet.) and reptiles (European green lizard *Lacerta viridis*) provide additional information on the past landscape (Tab. 3). The former generally inhabits marshy, wetland areas, whereas the latter is native to Southeastern Europe, preferring the dense, bushy vegetation in open woodland, fields, embankments and bramble thickets, and especially damp locations in the Southern Balkans.

The flotation of selected sediments at Vrbjanska Čuka also enabled the recovery of small and/or fragmented archaeological finds, such as pottery, stone and bone tool fragments, but also personal adornments. A fragmented bead made from marine shell was found in the flotated sample from Building 2. It is worth noting that similar beads have been known from other Early Neolithic sites in Macedonia, such as Amzabegovo and Vršnik⁶⁴. These finds provide unique insights into the manners of bodily adornment among the inhabitants of Early Neolithic settlements in Macedonia, as well as their interconnections or indirect contacts with distant, coastal communities.

Organic residue extraction and analyses

One of the most informative approaches to unravel the uses of prehistoric vessels and diet is the application of GC, GC-MS and GC-C-IRMS to study the lipids extracted from the pottery matrix⁶⁵. Throughout the lifetime of a pottery vessel, lipid molecules enter the microscopic pores of the unglazed prehistoric ceramic. This especially occurs during heat treatment (cooking). The micro-pores present an isolated environment, preserving this organic material until today and, with the help of modern technology, the prehistoric residue from the pottery can be extracted. Through chemical and isotopic analyses, we can identify the food products processed in pottery containers thousands of years ago. The importance of this information is manifold; pots used for cooking are easily identified.

⁵⁹ Naumov *et al.* 2018b, 277.

⁶⁰ Živaljević et al. 2017; Stojanović/Obradović 2016.

⁶¹ Lasota Moskalewska/Sanev 1989.

⁶² Ristić 1977, 25.

⁶³ Locker 2018; Cucchi et al. 2011.

⁶⁴ Dimitrijević et al. in press.

⁶⁵ Dudd/Evershed 1998; Evershed 2008; Correa-Ascencio/Evershed 2014.

Moreover, associations of pottery morpho-types with specific products and similar cooking patterns and kitchen preferences are revealed. But the principle importance of these analyses lies in the study of past diets, subsistence diversity and paleoenvironment⁶⁶.

In this regard, 27 potsherds from Vrbjanska Čuka were selected for lipid analysis as part of a wider Balkan Neolithic research project and submitted for analysis at the Organic Geochemistry Unit at the University of Bristol⁶⁷. Seven potsherds contained ancient lipids, which is the usual retrieval rate for the region⁶⁸. ¹³C values measured from the palmitic and stearic fatty acids contained in the extract discriminate the animal origin fats into three groups: dairy, ruminant adipose and non-ruminant adipose (Fig. 18). Pure, non-ruminant (pork) lipids were not detected. Dairy fats were confirmed only in one small, red-slipped, polished ceramic bowl. Being the first direct evidence for milk processing in Macedonia, this potsherd was subjected to compound-specific radiocarbon dating, a novel method using the organic extract to obtain a direct absolute date for the pot and the associated context⁶⁹. The obtained date has been presented above where the dates from the radiocarbon analysis are discussed.

Other animal products were identified in the Vrbjanska Čuka pottery as well (Fig. 18). Three vessels with different shapes were used for cooking ruminant animal meat, two of which also presented biomarkers for plant processing. Two other potsherds gave a mixed signal of ruminant and non-ruminant (pork) meat. Beside these potsherds, one necked jar contained remains from plant food processing without any traces of animal fats. This is direct evidence for the importance of cereals in the diet at Vrbjanska Čuka which had been inferred from querns, sickle blades, storage units and carbonized grains. The samples were also tested for aquatic product biomarkers and beeswax traces, but they were not detected.

The current study assemblage is too small for a wide statistical elaboration or pattern identification, but presents important initial information from organic residue analysis on the diet and subsistence diversity in Neolithic Pelagonia, providing a unique, close-up view of the early agricultural economy and society.

Photogrammetric reconstruction of the site and granary in Building 1

As part of the complex multidisciplinary research methodology, a few terrestrial and airborne photo field surveys were made⁷⁰. Using this data via the application of the methodology of photogrammetry, moderately and highly detailed 3D models (including high-resolution orthophotos and digital elevation models) were generated for the excavated area and for two particular structures from Building 2 (Fig. 19). The updated spatial data from a total station was missing, but the horizontal and the vertical distortion in the model as measured from the meter scales is negligible. Apart from these results, the possibilities and the limitations for the use of the 3D data in the advanced spatial analyses (horizontal and vertical sections cutting throughout different features at different places and elevations, also LCP-least cost path, view-shed and flood analyses) are tested with a high level of success. This was made as an effort to find the exact methodological approach which could cover all aspects of the complex archaeological site, from excavation and documentation, throughout research and protection and finally for its adequate presentation. Therefore, the use of GIS technology was considered.

A 3D IBM (Image Based Modeling) recording procedure was implemented as well for the acquisition of precise geometry of the daub structure – i. e., the massive granary in Building 1 at Vrbjanska Čuka (Fig. 20). The procedure included the collection of a total amount of 480 images, taken from various perspectives, to provide the best possible coverage of the whole structure. These images were later processed through specialized software with the purpose of providing a fully virtual, 3D-reconstructed feature of the granary, in scaled measurements, jointly with color data. Measurements for providing a scaled model were taken on-site; the average error reported was under 1 mm, which is suitable for the purposes of general documentation.

The benefits of the IBM product are numerous: first and foremost, the granary structure is in need of reconstruction treatment, and the final product of IBM recording can serve as a pre-reconstruction snapshot of the feature's state (to be used for verification of successful reconstruction and conservation treatment). Nevertheless, there is a great potential in using the model for virtual reconstruction of the granary's context, its surroundings and usage in 3D modeling software. This field of research in archaeolog-

⁶⁶ Evershed *et al.*2008; Dunne *et al.*2012; Cramp *et al.*2014; Salque *et al.*2015; Stojanovski *et al.* 2020b.

⁶⁷ Stojanovski *et al*.2020a.

⁶⁸ Whelton et al. 2018; Cramp et al. 2019.

⁶⁹ Casanova *et al.* 2020.

⁷⁰ Naumov et al. 2018b; Naumov et al. 2018c; Naumov et al. in press.



Fig. 18: a: δ^{13} C values for two fatty acids ($C_{16:0}$ and $C_{18:0}$) for archaeological fats extracted from Vrbjanska Čuka, plotted against modern reference values from C3 diet raised animals in Britain (Copley *et al.* 2003); b: Δ^{13} C ($\delta^{13}C_{18:0}$ – $\delta^{13}C_{16:0}$) values for the same Vrbjanska Čuka samples. The ranges shown here represent the mean ± 1s. d. of the Δ^{13} C values for a global database comprising modern reference animal fats from Africa, UK (animals raised on a pure C₃ diet) Kazakhstan, Switzerland and the Near East (Dudd & Evershed 1998; Spangenberg *et al.* 2006; Outram *et al.* 2009; Dunne *et al.* 2012); c: The ceramic vessels from Vrbjanska Čuka containing ancient lipids. The triangle marks a ruminant/non-ruminant adipose fat mixture, the square marks ruminant adipose fat, the circle marks plant processing and the diamond stands for dairy fats (Graphs and drawings: Darko Stojanovski and Stefanija Stojanovska).

ical practice has become more prominent in the past years as the technology for 3D scanning is affordable to a wide audience of professionals and amateurs. As a logical extension of the 3D scanning, the virtual reconstruction and presentation of archaeological cultural heritage contributes an important aspect of public outreach – especially when there is an interpretation gap between non-specialist viewers and the importance of objects of heritage. The aforementioned data will be used for similar purposes, as the granary is one of the best-known architectural symbols of Neolithic Macedonia and more valuable research content from this endeavor still remains to be tackled and presented to the scientific community and general audiences alike. Besides the photogrammetry of the granary, a 3D model of anthropomorphic miniature house was also generated. The model enables



Fig. 19: 3D model made with photogrammetry and orthophoto images of the Oven 47 and structures for storing and processing cereals in the Building 2 (Illustration: Hristijan Talevski).



Fig. 20: 3D Image Based Modeling of the granary in the Building 1 (Illustration: Jugoslav Pendić).

a permanent approach to this find and study of its features by digital manipulation of its exterior and interior. Apart from its scientific potential, this model is also used for the presentation of the finds from Vrbjanska Čuka and their interaction with a wider group of viewers.

Another method also applied was a site-wide scan using an infrared scanner, which provides 3D presentation of the archaeological trench and its features. This method was used for the purpose of documentation and study of particular contexts while the research team is out of the trench, but also for a more tangible presentation of the site. As a result, the 3D presentation was labeled with information tags related to the site and with some of the most distinct architectural units. The 3D presentation was also adjusted for the employment of the Core VR equipment which enables a virtual reality visit to the site and the archaeological trench in particular.⁷¹

Conclusion

The current research of Vrbjanska Čuka is being performed in the same central area of the tell as in the 1980s excavations, but has introduced much more significant data on the stratigraphy, architecture and the economy of the Neolithic settlement. This is due to the multidisciplinary approach, but also as a result of thorough recording of

⁷¹ Naumov et al. in press.

all archaeological features. Apart from the employment of the basic methods and the study of finds, this research also involves geomagnetic scanning, digital topography, archaeobotany, archaeozoology, radiocarbon dating, geoarchaeology, lipid, isotope and use-wear analyses, as well as 3D modeling of the trench, structures and artifacts with photogrammetry and drone orthophotography. All these components of the research enabled a comprehensive understanding of the Neolithic settlement at Vrbjanska Čuka and the community which established the tell and continuously lived there for several hundred years.

Although the tell as a whole is approximately 3.5 m high, the stratigraphy indicates 1.1 m of Neolithic levels in three horizons determined by the architectural features and not by material culture. A further revision of the Neolithic horizons will be necessary upon extending the archaeological trench and putting together a detailed insight into the material culture and the architectural features which would potentially be found. Even though ceramic vessels - the most frequent finds - do not bear significant differences between the initial and latest Neolithic horizon at Vrbjanska Čuka, if examined further, they could still contribute towards an even more thorough understanding of the changes in this settlement, but also within the agricultural society. In this regard, radiocarbon analyses provide a closer look into the chronology of the settlement currently dated in the range of 6000 and 5700 CalBC as a temporal span between the beginning and end of the Neolithic settlement. So far, this date places the site in the final phases of the Early Neolithic, completely corresponding to the dating of several other sites in Pelagonia. The dating of the selected samples from each Neolithic layer to determine the chronological sequence of the entire Neolithic settlement is one of the aims of the forthcoming study seasons.

The architectural features discovered so far are typical for the Neolithic in the Balkans, consisting of six buildings built atop one another in three architectural horizons with a total of 14 buildings discovered in the entire archeological trench (although 17 were recorded in total, some belong to a single unit). Some of these buildings contain construction elements previously not asserted or discussed in the study of the Macedonian Neolithic. Namely, apart from the standard, burnt, massive daub common for Buildings 1-4, 6 and 9, the remaining buildings such as Buildings 7, 8, 10-14 and 16 were made of dried daub that was not exposed to fire, i.e. was not burnt during their construction or prior to their abandonment. Building 5 was made of massive wooden posts with no daub, therefore it can be identified as an individual wooden structure or as an eave component of the Building 2. Building 14 has deep channel foundations where the posts have been inserted, whereas Building 15 could have also functioned as a pit dwelling or was used as a structure for economic purposes. The variety of architectural features at Vrbjanska Čuka indicates that there were at least four different types of buildings with a number of larger and smaller grannaries, bins, ovens and platforms made of daub in their interior. Some were cleared before the abandonment and numerous grinding stones were found upside down, referring to symbolic activities associated with the final stages of the buildings. Nevertheless, the large quantity of clay installations and grinding tools demonstrate the intensive processing of crops and an economy focused on agriculture.

In order to determine the scopes of the farming economy and crop processing in particular, use-wear and archaeobotanical analyses were performed that confirmed the presence of sickles, but also of einkorn wheat, emmer wheat, barley, lentils, peas, as well as a variety of gathered wild fruits used in the diet. The intensity of use of the sickle blades and the high amounts of cereal chaff present in building deposits suggest that agriculture was a very important activity associated with the inhabitants of the excavated structures and that the processing of agricultural products was a daily task that defined the functionality of certain spaces in the buildings. The storage of cereals is also corroborated by the remains of house mouse, which, to the best of our knowledge, represent the first evidence of the presence of this commensal species in Europe. Regarding the economy and animal products, the results of lipid analyses confirm the use of dairy products, animal meat and plant food, whereas the results of archaeozoological analysis suggest a mixed cattle and caprovine (and, to a lesser extent, pig) herding strategy, with an additional food supply of freshwater mussels, fish, wild game, and possibly waterfowl. The bioarchaeological and geoarchaeological studies also provide insight into the past environment of the site; i.e. the presence of certain elements of floral and faunal taxa is indicative of slow-flowing waters (wetlands) near Vrbjanska Čuka, but also forests (with oak and pine wood used in the settlement).

Considering the data obtained by the excavation, dating, laboratory analyses and material culture studies, it can be proposed that Vrbjanska Čuka was settled in the Early Neolithic by farming communities with exceptionally high aesthetic skills and knowledge of multiple techniques for building constructions and production of household items. This is additionally manifested by the exquisitely made fine ceramic vessels and their frequency within ceramic production, as well as by several buildings containing various architectural elements and decorated daub interior structures. The production of figurines, altar tablets and anthropomorphic house models indicates a symbolic perception of the human body and the embodiment of the domestic space as crucial for the establishment of solid relationship between several generations of inhabitants in the Neolithic settlement.

The results of the current research indicate that Vrbjanska Čuka is a complex site, especially when considering the data from the geomagnetic survey, which elaborates the presence of an enclosing ditch and a set of buildings organized in groups. It was a farming-oriented village set in an environment which attracted numerous Neolithic and Chalcolithic communities to establish their settlements, as confirmed by the reconnaissance and geomagnetic scanning of its surroundings where a number of other tells were recorded. The research of Vrbjanska Čuka is still ongoing, so the current multidisciplinary study of finds and organic remains, as well as the further excavation of buildings and new layers will provide significantly more information on the agricultural society that inhabited this tell in the northern parts of Pelagonia.

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Foundation for the Study and Preservation for Tells of Prehistoric Old World (FSPT)

Application for a geophysical project on the prehistoric tell-settlement of Berettyóújfalu-Herpály in 2023

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The prehistoric tell-settlement of Berettyóújfalu-Herpály has long been well known in European prehistoric research. Its particular interest lies in the fact that the almost 4 m long stratum also contains settlement levels from the Neolithic and Bronze Age periods in the Berettyó region of the Great Plain (*Summarised in: Kalicz, N.-Raczky, P.-Anders, A.-Kovács, K. : Pictures of an excavation. The Neolithic village at Berettyóújfalu-Herpály. Pytheas Printing House, Budapest 2011)* The excavations between 1977 and 1982 mainly concentrated on this tell-settlement, and thus relatively little information is available on the relationships of the external environment. In the meantime, the change in professional approach and the expansion of technical possibilities together resulted in intensive and complex investigations being extended to the narrower and wider environment of the Neolithic and Bronze Age settlement mounds of the Carpathian Basin. As a result, it has now become clear that many, many affected settlement mounds are surrounded by smaller or larger single-layer outer settlements.

Driven by this demand, with the financial support of DAI-RGK, a magnetic prospecting program was implemented in an area of 15 ha in the vicinity of the Berettyóújfalu-Herpály tell settlement. Due to the problems of the Covid virus, the Hungarian MUNIFEX LTD. company carried out the magnetic prospection in 2022 (Fig. 1-2.). As a result, the settlement complex consisting of the tell and a single-layer settlement was demarcated from the north and west. An additional 25 ha of magnetic measurements would be required to determine the entire extent of the deposit, i.e. to determine the southern and eastern boundaries (Fig. 3). As part of my personal application, I would also like to have this work done by MUNIFEX LTD, who can obtain the necessary permits through the Hungarian National Museum, as was the case with DAI-RGK. According to their attached price offer, they would carry out the outlined work at a unit price of 300 EUR/ha, i.e. for 25 ha, for a total of 7,500 EUR. We could implement the program and prepare the summary report by the deadline of July 31, 2023.

Dr. Pál Raczky

Budapest, 13.12.2022.

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Fig. 1. Berettyóújfalu-Herpály. First phase of the geophysical survey in 2022



Fig. 2. Berettyóújfalu-Herpály. Result of the geophysical survey in 2022



Fig. 3. Berettyóújfalu-Herpály. Future planned phase of the geophysical survey



QUOTATION FOR MAGNETOMETRY SURVEY AT BERETTYÓÚJFALU-HERPÁLY SITE (HUNGARY)

QUOTATION FOR:

FOUNDATION FOR THE STUDY AND PRESERVATION OF TELLS IN THE PREHISTORIC OLD

World

Neuffenstrasse 57 Esslingen am Neckar D-73734 GERMANY

FROM:

MUNIFEX LTD. VAT: 26731083-2-13 Company Register: 13-09-199629 János utca 2. Szentendre H-2000 HUNGARY

QUOTATION

Dear Prof. Dr. Tobias Kienlin,

We would like to give you the following quote with close collaboration with Prof. Dr. Pál Raczky's tender **"Application for a geophysical project on the prehistoric tell-settlement of Berettyóújfalu-Herpály in 2023."** Earlier in 2022 our company were funded by the DAI-RGK to perform a magnetic survey at the 15 hectares large inner structure of Berettyóújfalu-Herpály. Within this survey we were able to delineate the northern and the western boundaries of the neolithic tell and its surrounding settlement.

However, for concluding this task, we need an additional magnetometry survey to fully cover the settlement and find its southern and eastern part. This would take approximately an additional 25 hectares area to survey within the area. As mentioned, we would perform this survey on behalf of Prof. Dr. Pál Raczky's tender.

For the survey of this area, we can give you the following quote:



	price per hectare	overall price for 25 hectares
Magnetometry survey at Berettyóújfalu- Herpály site (HUNGARY) for 25 hectares	300 EUR	7500 EUR

Magnetometry survey will be done with 16 channel SENSYS MX system at 25 cm measuring interval with RTK-GNSS positioning. The cost consists of the overall cost for survey, the data processing and interpretation. The price is the gross amount, VAT is paid by us in Hungary from this amount.

BACKGROUND FOR QUOTATION

MUNIFEX LTD. is a special archaeological company based in Hungary, suited for archaeological surveys in close collaboration with Hungarian museums, universities, and heritage authorities. Due to our close collaboration with the Hungarian National Museum, we are the only company presently suitable to obtain a permit for large-scale archaeological survey, both from the authorities and from the landowners at the area.

Commitment deadline for the survey documentation: 2023. 07. 31.

Szentendre, 2022. 12. 09.

Dr. Máté Stibrányi Executive director MUNIFEX Ltd.

EÖTVÖS LORÁND TUDOMÁNYEGYETEM Bölcsészettudományi Kar

RÉGÉSZETTUDOMÁNYI INTÉZET

1088 Budapest, Múzeum krt. 4/B Tel.: (36-1) 411-6554 Fax: (36-1) 411-6553 Email: info@regeszet.elte.hu



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INSTITUTE OF ARCHAEOLOGICAL SCIENCES

> H-1088 Budapest, Múzeum krt. 4/B Phone: (36-1) 411-6554 Fax: (36-1) 411-6553 E-mail: info@regeszet.elte.hu

LETTER OF RECOMMENDATION

On behalf of the Institute of Archeology of Eötvös Loránd University, I officially support the application of **Prof. Emeritus Pál Raczky** to the Foundation for the Study and Preservation of Tells in the Prehistoric Old World (FSPT). The scientific significance of the magnetic prospection planned at the Berettyóújfalu-Herpály tell-settlement would be of great benefit not only to the research of prehistory in Hungary, but also in Southeast Europe.

At the same time, all this could provide our institution a financial background for the continuation of interdisciplinary research established in the framework of the scientific cooperation with Römisch-Germanische Komission des Deutschen Archäologischen Instituts, for the implementation of a new investigation phase.

Budapest, 13rd December 2022



Prof. Dr. Tivadar Vida Director





FOUNDATION FOR THE **STUDY** AND **PRESERVATION** OF **TELLS** IN THE PREHISTORIC OLD WORLD

Neuffenstraße 57 · D-73734 Esslingen am Neckar

Prof. Dr. Raczky Pál Institute of Archaeological Sciences Eötvös Loránd University Múzeum krt. 4/B 1088 Budapest <u>Ungarn</u>

14.01.2023

Subject: Geophysical prospection on the prehistoric tell settlement of Berettyóújfalu-Herpály

Dear Prof. Raczky,

following the recent meeting of our boards, I would like to let you know that your proposal 'Geophysical prospection on the prehistoric tell settlement of Berettyóújfalu-Herpály' has found unanimous approval regarding the aims and the quality of your work proposed and your project's match with the purpose of the foundation's statutes.

We are pleased, therefore, to inform you that the foundation is ready to support your work in 2023 with funds amounting to **4.500** Euro for expenses as stated in your application and budget calculation.

Funding is subject to your written acceptance of our funding guidelines and general information for applicants attached to this letter. Please note, in particular, our invoicing regulations, and that we require receipts for all travel and material expenses *etc*. granted.

A final report and settlement on your work is to be submitted at the latest six weeks after expiry of the funding period, *i.e.* by February 2024. We would also kindly ask you to let us have a short text

(c. 1–2 pages) and a couple of images for the presentation of your project in the 'funded projects' section of our homepage.

Should you have any questions please do not hesitate to get in touch.

We wish you every success in your work on this project and remain with best regards, yours sincerely,

T.U.L

Prof. Dr. Tobias L. Kienlin (Chairman)

Attachment: Funding Guidelines and General Information for Applicants (2023 version)



INVOICE

Number: MNFX-2023-16

CUSTOMER:	Payment method:	bank transfer	
Foundation for the Study and Preservation of Tells in the Pre-	Completion date:	03/07/2023	
historic Old World Németeratéa DS 72724 Seclinger em Nachar	Issue date:	03/07/2023	
Nemetorszag, DE-73734 Essungen am Neckar Neuffenstrasse 57	Due date:	02/08/2023	

Description	Qty.	Unit price	Net price	VAT	VAT value	Gross price
Archaeological magnetometry survey at Berettyóújfalu - Herpály tell-site, phase 2.	1 pcs	3,543	3,543	27%	957	4,500
Total:			3,543	N	957 /AT 27 %: 957	4,500

Total:

4,500 EUR

VAT amount: 357,650 HUF. MNB exchange rate 373.72 HUF. Gross amount 1,681,740 HUF. The invoice is valid without a signature or stamp!

IBAN: HU32107004407144359551100005

SWIFT: CIBHHUHB



GEOHYSICAL SURVEY OF BERETTYÓÚJFALU-FÖLDVÁR SITE AND ITS SURROUNDIGS (PHASE II.)

REPORT





2023

Content

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Application for funding to hire a research assistant for the project A multi-method toolkit to study burnt daub at the University of Cologne

Dr. Jana Anvari, Dr. Astrid Röpke, Prof. Dr. Tobias Kienlin (Department of Prehistoric Archaeology, University of Cologne)

With this application, we seek 6061€ from the Foundation for the Study and Preservation of Tells in the Prehistoric Old World to hire a research assistant to support data archiving for our project *A multi-method toolkit to study burnt prehistoric daub*.

The project: research aims

This project is mostly a methodological pilot study that aims to establish a multi-method tool kit as a new standard in archaeological research on burnt daub. Daub fragments are the remains of prehistoric houses made of wattle and sediment, the sediment parts of which have been hardened and preserved by fire, while the wooden framework has not survived. The project brings together existing methodological approaches to enable a more comprehensive social interpretation of the building material daub.

Daub, although a major component of prehistoric tell sites in southeast Europe and other regions, is an archaeological material that is not routinely studied. When we started collaborating with different excavation projects in the context of the Daub project, it transpired that most projects do not collect daub, but remove it to the spoil heap like soil; while others had (sometimes selectively) collected daub, but not done anything with it besides storing it. The reason for this is a mixture of lack of awareness of the research potential of daub, or building materials more generally (Love 2012:141), and the logistical challenges caused by daub: as we have ourselves now experienced, daub is bulky and heavy, but at the same time fragile and prone to become mouldy if not properly dried prior to bagging. Where daub has been studied, archaeological work has focused on individual aspects of (often small subsamples of the available) daub from individual sites, while multi-method and comparative analyses so far do not exist. Previous archaeological research has focused on one of four characteristics of daub:

- First, shape: The shape of daub fragments has been documented with traditional archaeological methods (typologies, sketches, descriptions, photos, drawings) in order to reconstruct details such as wall thickness and the structure of the wooden framework (Bánffy and Höhler-Brockmann 2020; Chetwin 2007; Jongsma 1997; Osztás 2020; Sherard 2009; Stevanović 1997).
- Second, sediments: clay used for building in daub and other construction techniques
 was examined using geoarchaeological methods to characterise the sediments used

in construction, e.g. particle size proportions or the identification of temper. Such scientific techniques were also used to estimate the temperature of the house fire that hardened the clay (Cammas 2018; Forget et al. 2015; Jordanova et al. 2018; Love 2012, 2013; Nodarou et al. 2008; Röpke and Dietl 2017; Sapir et al. 2018; Shahack-Gross et al. 2018).

- Third, plant components: daub has also been extensively studied archaeobotanically, not least because plant remains (imprints, macrobotanic remains Figure 1; and phytoliths) are often well preserved in the building material (Dal Corso et al. 2018; Fritzsch et al. 2022; Hovsepyan and Willcox 2008; Newton 2004; Seltzer and Peacock 2011; Stika 2005).
- And fourth, direct dating: macrobotanic remains and phytoliths in daub can be radiocarbon dated (Chmielewski et al. 2017; Piperno 2006). By dating plant remains inside daub, the time of house construction or houses phases can be determined more precisely than with the usual indirect approach, e.g. by dating of layers under and above the floor.

So far, however, no research project has holistically analysed different characteristics of daub by integrating a variety of analysis techniques from the four overall categories described above (shape, sediments, plant components, and direct dating). Our project intends to establish a multi-method approach as a new standard in the archaeological research of daub, as a basis for researching a more comprehensive picture of prehistoric construction techniques and social structures at complex tell sites. We are using, or are planning to use, the following methods and workflow (this list includes the names of the researcher(s) who conduct and/or supervise each work step; students are involved in various work steps in an assistant capacity):

- Shape analysis: sorting of all fragments by form type (amorph; with wood and/or wattle impression; with surface; with wood impression and surface; decoration) as well as detailed individual recording (Figure 2) of selected diagnostic pieces (JA)
- Initial description of the macroscopic properties of selected diagnostic pieces, e.g. colour, visible plant and inorganic inclusions (JA)

Based on this initial sorting of all daub fragments, we select pieces for specialised analyses:

 Detailed shape documentation and analysis through high-resolution photography, drawings (Figures 3-4) and 3D documentation (JA and other Archaeology staff at University of Cologne)

- 4) Analysis of sediments and plant components (macrobotanic remains, impressions, phytoliths) as visible on the outside of fragments under a microscope (AR and other colleagues at the Laboratory for Archaeobotany and Geoarchaeology at the Department of Prehistoric Archaeology)
- 5) Analysis of sediments and plant components in individual fragments through thin sections (AR)
- Destruction of individual fragments to extract macrobotanical remains (through floatation) and phytoliths for analysis (JA, AR and other colleagues from the Lab for Archaeobotany and Geoarchaeology)
- 7) Radiocarbon dating of plant remains in the clay (JA and external laboratories)
- 8) Potentially further analyses on the thin sections for elemental analysis, color measurement and determination of firing temperatures; using a scanning electron microscope (SEM) and micro-XRF, FTIR spectroscopy and Raman spectroscopy).

Several of these work steps involve a trial-and-error approach. For example, the sorting protocol and data sheet for recording individual diagnostic pieces (1-2; see Figure 2) were developed by JA in 2018. We plan to try floatation (6) in the next few weeks to see how many plant remains can be gathered with this method. While conducting each analysis step, we attempt to identify the most efficient (i.e. highest quality for lowest requirement of resources like time, money, specialized equipment, specialized expertise) way to reach research goals. For example, our project work has already produced the realisation that using a microscope (see 4), it is possible to do much of the analyses normally done on thin sections, such as species identification of phytoliths or particle size analysis. This means a significant reduction in the time and funding needed for geoarchaeological studies of daub, since the creation of thin sections is costly and, in the case of a hard material like daub, can take months. We aim to produce a set of clear recommendations (best practice, required resources) both for work in a setting with many resources, as we ourselves have while working in Cologne, as well as a reduced 'field version' with more limited resources (see Love's 2017 'field kit' of methods for the study of mudbrick).

Daub data then needs to be integrated into the spatial context at each site, to determine whether there are differences between different buildings, parts of settlements, or chronological phases inside a tell. We believe that by producing a diverse data set on daub, in which information generated by different types of analyses can be cross-referenced, we will be able to reach more, and more reliable, social and architectural interpretations of the building material daub. Previous detailed investigations of building methods in prehistoric settlements in the eastern Mediterranean have, for example, pursued the following social questions, which are also important in our project: Was building a house a (possibly centrally organised) community activity or a matter for individual households; which communities of practice and knowledge existed within a settlement around construction (Forget et al. 2015; Love 2013; Nodarou 2008; Sapir et al. 2018; Shahack-Gross et al. 2018)? Was the construction process deliberately used as a performance to make social identities visible (Love 2013)? How were raw materials from the surroundings of the settlement selected for the construction of the house and what does this say about the relationship of the residents to their natural environment (Nodarou 2008; Tung 2013)? Did all households have equal access to natural resources used as building materials; were there communities of knowledge regarding the location of resources (Tung 2013)? Were there changes in building practices over the settlement period of a tell site and what does this say about changes in social structures or natural resources (Love 2013; Tung 2013)?

The project: case studies, organisational setup and available funding

Case studies for this project are tell sites in southeastern Europe, which reflects the scope of our department. However, daub has been used throughout many periods and many areas of the world (see e.g. Chetwin 2007 for a study of daub from Cambodia; Sherard 2009, Seltzer and Peacock 2011 for studies from the Americas). Results from our project, a better workflow for the archaeological study of daub, are therefore relevant beyond the geographical area we currently study. We are currently working on daub from the following tell sites:

- Toboliu, Romania (Bronze Age)
- Borsodivànka, Hungary (Bronze Age)
- Bükkabrany, Hungary (Bronze Age)
- Vrbjanska Čuka, North Macedonia (Neolithic) preliminary results have been published in Naumov et al. 2021
- Koutroulou Magoula, Greece (Neolithic)
- In 2023, we will additionally integrate material from Neolithic sites in Albania where JA's project *Contextualising the Neolithic of the Korça plain* will excavate sondages.

The Daub project had its origin in a fortuitous corridor conversation in the summer of 2020, but has grown into a sizeable venture since we started working in early 2021. It also has the potential to grow practically by itself because we receive more and more material from the collaborating excavation projects, as well as requests to work on material from additional sites. We view this as a confirmation of the significant existing need for the study of daub. The possibility of bringing material from most sites to Cologne for analysis allows us to continually

work on the project, and to involve students who through this project have the possibility to practice the analysis of archaeological finds (and count this as practicals for their degrees) without needing to travel. We have installed a fixed ,sorting day' per week and a group of 11 students is currently working in the project, four of which are also writing theses about the material and conducting further analyses such as geoarchaeological characterisations of daub fragments.

We received a seedcorn grant (8000€) from the University of Cologne in 2021 to cover costs for specialised lab analyses like radiocarbon dating or the creation of thin sections. Most of the work, however, has been made possible by using resources already available at UoC: the expertise and equipment of the Laboratory for Archaeobotany and Geoarchaeology; student volunteers; the staff photographer and drawsperson employed in the Archaeology departments (Philipp Groß, Anja Rüschmann). 3D documentation has been facilitated by the expertise of the 3D expert in the section for Computational Archaeology at UoC, Sebastian Hageneuer, who has kindly also integrated three daub fragments into a methodological pilot study funded by an external grant. The transport of the material from Romania and Hungary to Cologne has been paid for by the respective excavation projects; the travel needed to work on the daub of Koutroulou Magoula and the Albanian sites has been/will be funded through JA's project funds. In the future, we aim to use further resources available at UoC, such as a 3D scanner owned by the IT service as well as expertise and equipment in the Geology labs, with which our department has an existing work relationship.

As was planned from the start of the project, our current work is a pilot phase preparing the writing of a larger third party grant proposal in the future, probably in late 2023 or 2024. The main aim of the current pilot phase is to establish a work flow or tool kit for the study of daub and to create first results to show the effectiveness of this tool kit – we consider this necessary to make the success of a larger grant proposal more likely. Apart from being the footing for a grant proposal, the current phase of the project will also produce publications. We plan one prominent journal paper describing our multi-method tool kit as well as publications about the daub from individual sites, which will include work from the student theses currently being written in the project.

Funding needed

As detailed above, the Daub project has so far been funded mostly through in-kind support from the University of Cologne (UoC) as well as collaborating projects; by volunteer work from students; and through a seed corn grant from the UoC for lab work. Because it has grown to a considerable size, however, the project most urgently needs a research assistant since JA lacks the time needed for the archiving of the constantly increasing amounts of data created by the project. A main task for the research assistant would be sorting and entering data into a digital database (lists, data sheets with descriptions of individual fragments, photos, drawings; in the future also results from lab analyses). In addition, the research assistant would, while entering data, identify and then solve possible problems in the body of data (e.g. contradictory fragment counts for a stratigraphic unit) as well as fill gaps, e.g. photograph diagnostic pieces that have not yet been photographed.

The following time table details anticipated tasks of the research assistant in 2023, based on a work load of 40h/month as is usual for research assistants at UoC:

month(s) in 2023	task
March–April	finalise configuration of the database (with JA)
April–September	sort available data and enter them into the database; identify problems and gaps in the body of data
May–July	create a more efficient workflow for data entry to prevent backlogs in the future (with JA)
October-December	solve problems in the data body, fill gaps
throughout	support JA's writing of reports, grant proposals and publications by compiling necessary data

To create a project database, we will use *iDAI.field*, created and managed by the German Archaeological Institute. *iDAI.field* has many advantages: It provides a database that can be adjusted relatively easily (i.e. not requiring a specialised IT person) to the requirements of each individual project. It is also a repository for the sustainable safekeeping of data; and if wanted, we can make the data open access at some point.

Allowing for the formalities needed to hire a research assistant at the UoC, the position could start on 15 March 2023 and therefore last for 9.5 months in 2023. There is already a suitable candidate, a MA student who is volunteering in the Daub project and has considerable experience in data management from a previous project. Hiring this candidate would require paying the rate for a student with a BA, as opposed to the lower rate for a student without BA, but her previous experience would significantly increase the quality and quantity of the work output.

638€ (monthly rate including oncosts for a research assistant with a BA degree working 40h/month at the University of Cologne)

x 9.5 months

= 6061€



Figure 1: Fragment of daub from Vrbjanska Čuka with imprint and preserved husks of an ear of wheat (published in Naumov et al. 2021; all photos by JA).



Figure 2: Daub fragment and data registration sheet in Koutroulou Magoula 2018.



Figure 3: A student taking high-resolution photos of daub in the photography studio at the Archaeological Institute at the University of Cologne.



Figure 4: Drawing of wattle impressions on a fragment of daub (Anja Rüschmann).

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FOUNDATION FOR THE **STUDY** AND **PRESERVATION** OF **TELLS** IN THE PREHISTORIC OLD WORLD

Neuffenstraße 57 · D-73734 Esslingen am Neckar

Dr. Jana Anvari Universität zu Köln Institut für Ur- und Frühgeschichte Weyertal 125 D-50923 Köln

14.01.2023

Subject: A multi-method toolkit to study burnt daub

Dear Dr. Anvari,

following the recent meeting of our boards, I would like to let you know that your proposal 'A multimethod toolkit to study burnt daub' has found unanimous approval regarding the aims and the quality of your work proposed and your project's match with the purpose of the foundation's statutes.

We are pleased, therefore, to inform you that the foundation is ready to support your work in 2023 with funds amounting to **6.000** Euro for expenses as stated in your application and budget calculation.

Funding is subject to your written acceptance of our funding guidelines and general information for applicants attached to this letter. Please note, in particular, our invoicing regulations, and that we require receipts for all travel and material expenses *etc*. granted.

A final report and settlement on your work is to be submitted at the latest six weeks after expiry of the funding period, *i.e.* by February 2024. We would also kindly ask you to let us have a short text (*c.* 1–2 pages) and a couple of images for the presentation of your project in the 'funded projects' section of our homepage.

Should you have any questions please do not hesitate to get in touch.

We wish you every success in your work on this project and remain with best regards, yours sincerely,

TUiL

Prof. Dr. Tobias L. Kienlin (Chairman)

Attachment: Funding Guidelines and General Information for Applicants (2023 version)

Sehr geehrte Foundation for the Study and Preservation of Tells,

am 14.1. 2023 hat die Stiftung eine Förderung in Höhe von 6.000 EUR für mein Projekt *A multi-method toolkit to study burnt daub* bewilligt.

Ich möchte die Mittel hiermit abrufen. Die Universität zu Köln hat bereits ein Projekt eingerichtet mit einem eigenen PSP-Element.

Bitte überweisen Sie die Mittel an die Hauptkasse der UzK mit Angabe dieses PSP-Elements:

Universität zu Köln Institut: Sparkasse KölnBonn BLZ: 37050198 Konto-Nr. 19 00 69 48 35 IBAN: DE44 3705 0198 1900 6948 35 BIC: COLSDE33 **Verwendungszweck:** D-76643-Z-679-142003000 Jana Anvari, Daub project

Mit vielen Grüßen und Dank,

Jana Anvari

Prof. Danny Rosenberg, PhD Laboratory for Ancient Food Processing Technologies (LAFPT) Zinman Inst. of Archaeology, University of Haifa 199 Abba Khousy Ave. Mount Carmel, Haifa, 3498838, Israel. E-mail: drosen@research.haifa.ac.il, Cel. 00-972-54-3093666

The very end of Tel Tsaf and the WHY question: Tracking abandonment patterns in the Jordan Valley, Israel

Abstract

A great deal is known today about why prehistoric sites thrived in affluent environments, however, we still lag in understanding the reasons behind their abandonment. The scarcity of archaeological data on this topic hampers a clear analysis of the factors that led to site desertion in the late prehistory of the southern Levant. This data holds the answers to questions that are as relevant today as ever, specifically the roles of environmental change and social tension.

The site of Tel Tsaf (Jordan Valley, ca. 5,200-4,700 cal BC), with its superb preservation of organic materials and mudbrick architecture, offers ideal conditions to study the role of environmental and socioeconomic conditions as factors leading to the abandonment of the site during the first quarter of the 5th millennium cal BC. This research aims to provide preliminary data about the probable reasons and causes that led the latest Tel Tsaf community to leave their village. The requested funds will be directed toward studying the very latest stratum of the site and will provide new insights concerning the possible agents behind this event or events. We will seek a better understanding of the respective roles of these factors in the process, that resulted in Tel Tsaf not being resettled until the Byzantine period. Through a multidisciplinary high-resolution contextual examination, the proposed research addresses the question of why a thriving, prosperous village, bearing notable evidence for large-scale food storage and farreaching, long-distance trade relations, was abandoned, leaving no obvious clues for the reasons behind it.

Project Need

The later prehistory of the southern Levant is discussed through the lens of increasing socioeconomic complexity (*e.g.* Ben-Shlomo and Garfinkel 2009, 2012; Gopher, 2012:1542–1543; Rowan and Golden 2009). Research emphasizes the transition from the Pottery Neolithic to the Late Chalcolithic period, which is renowned for the development of metallurgy, increasing craft specialization, and a widening symbolic repertoire (Rowan and Golden 2009 and see references





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therein). Within this debate, the Middle Chalcolithic period bridges the gap between the Early Chalcolithic and the Late Chalcolithic periods, forming approximately 500 years (ca. 5,200–4,700 cal BC). During the Middle Chalcolithic period, there are several regionally bound cultural entities defined by site clusters and unique material culture, forming islands of distinct cultural phenomena (Garfinkel *et al.* 2020:19–28; Gopher 2012).

One of the most fundamental questions in archaeological research for the Late prehistory of southern Levant, is why sites are being deserted and more specifically, how these events are influenced by human activities (*e.g.* social tension, overgrazing, economic crises, or conflicts with neighboring communities), environmental conditions (*e.g.* drought, floods, earthquake) and the interplay between these. This question is even more pronounced when sites are located in affluent environments, where water sources and fertile lands are abundant. Surprisingly, until now, these questions have never been addressed for prehistoric sites in the southern Levant. The Jordan Valley is one such location, specifically the area between the Sea of Galilee and the modern-day city of Beit Shean, characterized by a high concentration of late prehistoric sites. The current project addresses the question of the reason or reasons leading to the desertion of one of the most notable late prehistoric sites in the region, the Middle Chalcolithic site of Tel Tsaf.

More specifically, we would like to use the site, which provides superb preservation of architecture and organic materials, as well as undisturbed and easy-to-access strata, as a case study, and to begin to address the question of whether environmental change led to its abandonment or whether there were other (economic) factors or (social or political) circumstances that forced the Tel Tsaf community to leave the site where they had been thriving for centuries. By exploring the very latest phases of occupation at the site, and extracting different datasets (cultural and bio-archaeological), we aim to provide a clear understanding of the driving forces that have led to the site abandonment and the interrelation between these factors. In turn, the results of our study will enable a better understanding of how late prehistoric communities in the region cope with changing conditions and settings and why they failed to adjustg to these changes.

Project History

The site of Tel Tsaf (Figs. 1-2), at ca. five hectares (Horn *et al.* 2019), is located near the city of Beit Shean (Israel new grid map reference 252360.701506) and is dated to ca. 5,200–4,700 cal





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Figure 1. The location of Tel Tsaf.





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המכון לארכיאולוגיה ע"ש זינמן, אוניברסיטת חיפה The Zinman Institute of Archaeology, University of Haifa The remains of four large courtyard buildings were found in the main excavation area (Area C, Buildings I–IV) as well as many other wall segments and various installations. Most of the latter are silos and cooking facilities (Fig. 3). A well and associated activity surfaces were found in Area B (Streit and Garfinkel 2015b), and several occupation layers were noted with no clear architectural features in Area E (Rosenberg *et al.* 2014). Four burials have been discovered so far in Area C, located in and around the silos (Garfinkel *et al.* 2009). One burial, in Building I, contained a female skeleton with hundreds of ostrich eggshell beads arranged in a chain around her waist and a small copper awl, which was later identified as the earliest evidence for metallurgy in the southern Levant (Garfinkel *et al.* 2014). Other finds include objects indicative of long-distance trade, such as obsidian, Ubaid pottery, beads of various minerals, shells from the Nile River and the Mediterranean Sea, and non-local figurines (Fig. 4, see also Garfinkel *et al.* 2009; Rosenberg and Klimscha 2021; Rosenberg *et al.* 2017, 2020).



Figure 2. A. A look on Tel Tsaf from the west, and B. Excavating in Room C70 in Area C.





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Figure 3. Tel Tsaf Area C, Building CI with Room C70 and surrounding silos and cooking installations.



Figure 4. Assorted finds from Tel Tsaf that reflect long-distance trade: A. Ubaid pottery, B-C. North Levantine figurines, D. A north Levantine 'token', E. A group of eight obsidian beads found together in Room C70 (coming from three different sources in Anatolia), and F. A copper awl found in an adult female silo burial in Building CI (the earliest copper items in the southern Levant).

The main gap in the study of Tel Tsaf relates to the latest phases of the settlement. While past studies focused on various aspects of Tel Tsaf, so far no research was conducted on the very latest strata of the site, more specifically on the possible reasons leading the village community to suddenly leave. The advantages of Tel Tsaf as a focal point for research focusing on reason





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Project Goals

This research aims to provide first insights into the reasons that lead the flourishing Tel Tsaf village to be deserted around 4,700 cal BC, only a century or two before the appearance of the Late Chalcolithic, Ghassulian culture in the region (e.g. for more on this culture see Rowan and Golden 2009 and references therein). Through a multidisciplinary high-resolution examination of the very latest strata of the tel, we intend to extract new data about environmental conditions in the first centuries of the 5th Millennium cal BC, as well as different datasets, concerning the village social and economic organization and the changes in long-distanced trade and exchange in various goods, specifically prestige goods.

The proposed research addresses the question of why Tel Tsaf ceased to exist, with no clear evidence for the reasons behind this event (no clear distraction layer was so far documented at the site). Through a systematic analytic agenda, focusing on integrative archaeology that combines current archaeological theory, methods from the natural sciences, and the examination of both microscopic and macroscopic remains we expect to provide a multi-faceted image of the factors that may have played a role in the processes that pushed the Tel Tsaf community to leave and never return to the site. The proposed research is designed to achieve the following objectives:

- 1) Generate independent evidence for the different variables leading to site abandonment.
- 2) Assess the role of each of the possible reasons and their reciprocal relations.





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Our working hypothesis is that both external (environmental) and internal (social and economic) factors resulted in, or lead to, the people inhabiting the site for ca. 500 years to move to a different location. These factors should be mirrored in the archaeological record and are expected to have a lucid archaeological signature that can be detected using meticulous excavation techniques and integrative analyses.

Project Methodology

In this study, we rely on multiple lines of evidence to track patterns related to the site's abandonment in the Jordan Valley during the early 5^{th} Millennium cal BC, only a few centuries before the rise of the Late Chalcolithic Ghassulian culture, which was characterized by advances in almost every realm (*e.g.* technology, metallurgy, burial, and cult). We intend to analyze the data from Pre-Ghassulian Tel Tsaf by implementing a variety of modern excavation and analytical methods in the field and the laboratory, to facilitate cultural and bio-archaeological datasets that will provide complementary data about the possible agents behind the abandonment of the site.

To retrieve ample environmental and cultural datasets and evaluate each of these modules separately, we will use the results of a preliminary GIS-based geomagnetic survey we conducted on the tel and its vicinity (Fig. 5). The results are used as a baseline for positioning our test probes. To maximize efficiency, these (10 probes) will be located in the most promising areas, with high concentrations of architectural and other tangible evidence for the nature of the settlement. To explore the characteristics of these latest phases of the settlement, we plan to excavate only the upper strata of the tel (up to ca. 60-80 cm below the site's surface) in each trench, opening a wide area in each of these, to increase the sample size.

We will excavate using state-of-the-art methods, including implementing a high-resolution excavation methodology that will allow for maximum stratigraphic and spatial control. Our basic field methodology will include small ($1 \times 1m$) excavation units, sifting in 2.0 mm sieves, total station-based recording, and the use of GIS software (ArcGIS) and drone-based photogrammetry (Fig. 6).





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'On-site–on-time' sediment analysis with the aid of microscopy, FTIR, and portable XRF will be conducted to help distinguish and define features. Intensive C₁₄ sampling will be performed during this stage, and the procedure will include sample pre-screening and context characterization in the field. The application of meticulous excavation methodologies will ensure the recovery of small material culture items as well as micro-fauna and molluscs. Intensive soil sampling and rigorous flotation protocols will ensure the retrieval of botanic remains, phytoliths, pollen, and starches. We will continue to conduct sampling that will produce faunal and isotopic data and organic residues for environmental reconstruction and understanding variation in culinary practices, herding patterns, and locations as well as the seasonality of specific tasks.



Figure 5. Magnetometer plot indicating potential features on the tel.





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Figure 6. Taking vertical photos with a drone for photogrammetry during the excavations.

During the 2023 excavation season we aim to open 10 probes and explore an estimated total of ca. 160 m^2 to a depth of ca. 60-100 cm below the site surface. An excavation permit from the Israel Antiquities Authority is already issued for 2022 and the 2023 license will be issued in January 2023.

Project Timetable

The 2023 Tel Tsaf excavations will take place during July 2023. Fieldwork will concentrate on sampling the very latest strata of the site in different areas. Following the fieldwork, additional sorting and cataloging of the finds will take place. The final report of the results will be drafted during December 2023. The Tel Tsaf project is directed by Prof. Danny Rosenberg of the Zinman Institute of Archaeology, University of Haifa. The excavation team is composed of students from the University of Haifa and other universities around the world as well as experts focusing on various aspects and analyses in the field and later in the laboratories (e.g. organic





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and botanic remains, fauna, malacology, isotopes, lithics, micro-morphology, hydrology, climate, mineralogy, geology, and sedimentology).

Budget

The total request from the Foundation for the Study and Preservation of Tells in the Prehistoric Old World (FSPT): €20,000. The main cost of the proposed project is directed toward the 2023 field season, which will be devoted to the exploration of the latest levels of the site, bearing evidence for the reasons behind its abandonment. The duration of the 2023 excavation season is set for 15 workdays. The crew is composed of 15 students and staff members (international and Israeli). The request from the Foundation for the Study and Preservation of Tells in the Prehistoric Old World is to cover excavation costs, related to sampling. The PI will be responsible for carrying out the various steps in both fieldwork and the proceeding laboratory research. The PI will dedicate an adequate amount of time to ensure the efficient execution and accomplishment of this multidisciplinary research. None of the sums requested were covered by previous funding granted to the Tel Tsaf project.

Item (Description)	Total
Archaeological excavations	
Accommodation for a crew of 15 during the excavation seasons	9,000
(15 days €600 /night)	
Rental car x 3, 20 days, €50 a day (including gasoline, oil, and	3,000
related unexpected maintenance costs)	
Scholarship for two field managers (PHD student/postdoctoral	8,000
researchers)	
Total (€)	20,000

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Details of the professional experience and qualifications of staff and specialists.

Prof. Rosenberg was until recently the head of the Department of Archaeology at the University of Haifa and he is the head of the Laboratory for Ancient Food Processing Technologies (LAFPT) at the Zinman Institute of Archaeology. He is an experienced archaeologist specializing in the prehistory of the southern Levant and is training and supervising research students and post-doctoral Researchers. Prof. Rosenberg has an intensive archaeological experience, and has led many projects in the field and his archaeological laboratory, including provenance and use-wear studies. Prof. Rosenberg is also the chair of the





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FOUNDATION FOR THE **STUDY** AND **PRESERVATION** OF **TELLS** IN THE PREHISTORIC OLD WORLD

Neuffenstraße 57 · D-73734 Esslingen am Neckar

Prof. Danny Rosenberg, PhD Laboratory for Ancient Food Processing Technologies (LAFPT) Zinman Institute of Archaeology University of Haifa 199 Abba Khousy Ave. Mount Carmel Haifa, 3498838 Israel

14.01.2023

Subject: The very end of Tell Tsaf

Dear Prof. Rosenberg,

following the recent meeting of our boards, I would like to let you know that your proposal 'The very end of Tell Tsaf and the WHY question' has found approval regarding the aims and the quality of your work proposed and your project's match with the purpose of the foundation's statutes.

It has been emphasised that this project features a specific tell-related question, i.e. the end of long-term commitment to specific places followed by a more transient settlement pattern. Such questions are discussed in the field of tension between cultural factors such as the conscious reference to tradition and ecodeterministic approaches, which are currently gaining in popularity again. On the other hand, a certain discrepancy has been noted negatively between this concern, which is to be investigated with a canon of relevant scientific methods, and the subsequent calculation, which essentially provides for the full funding of the corresponding excavations and has not been adapted to the possibilities of the FSPT.

For this reason and general constraints on our means for 2023, full funding according to your application is rejected.

However, the project idea and the question of the end of tell-living are considered worthy of funding. We are pleased, therefore, to inform you that the foundation is ready to support your work in 2023 with funds amounting to **5.500** Euro specifically for the implementation of the scientific investigations planned to accompany the excavation, such as micromorphology or palaeobotany.

Funding is subject to your written acceptance of our funding guidelines and general information for applicants attached to this letter. Please note, in particular, our invoicing regulations, and that we require receipts for all travel and material expenses *etc*. granted.

A final report and settlement on your work is to be submitted at the latest six weeks after expiry of the funding period, *i.e.* by February 2024. We would also kindly ask you to let us have a short text (*c.* 1–2 pages) and a couple of images for the presentation of your project in the 'funded projects' section of our homepage.

Should you have any questions please do not hesitate to get in touch.

We wish you every success in your work on this project and remain with best regards, yours sincerely,

Thil

Prof. Dr. Tobias L. Kienlin (Chairman)

Attachment: Funding Guidelines and General Information for Applicants (2023 version)

Antrag für eine finanzielle Unterstützung der archäobotanischen Untersuchungen in Borsodivanka (Ungarn) – Proben aus den Kampagnen 2022–2023

Dr. Tanja Zerl Labor für Archäobotanik, Institut für Ur- und Frühgeschichte Universität zu Köln

1. Einleitung

Die Erforschung bronzezeitlicher Tellsiedlungen hat eine lange Tradition in Ungarn. Allerdings wurden erst in den vergangenen Jahren zunehmend ganze Mikroregionen in den Blick genommen, um das chronologische und funktionale Verhältnis langlebiger Siedlungshügel zu ihrem Umfeld zu bestimmen. Desgleichen gilt für die naturräumlichen und klimatischen Gegebenheiten, die diese Lebensweise ermöglichten, bezüglich derer zuletzt vermehrt naturwissenschaftliche Untersuchungen verfügbar wurden (z. B. archäobotanische Untersuchungen in Százhalombatta-Földvár: Gyulai 1996; Vretemark et al. 2010; Stika/Heiss 2013; Kovács et al. 2020).

Seit 2012 werden von den Universitäten Miskolc (Ungarn) und Köln sowie dem Herman Ottó Museum (Miskolc) im Rahmen des BORBAS-Projektes (Borsod Region Bronze Age Settlements) intensive siedlungs- und landschaftsarchäologische Untersuchungen auf Hatvanund Füzesabony-zeitlichen Fundplätzen in der Borsod-Ebene sowie entlang der Ausläufer des Bükk-Gebirges im Nordosten Ungarns durchgeführt (u. a. Fischl et al. 2012; Fischl et al. 2015; Kienlin et al. 2018). Hierbei stehen gleichermaßen Fragen der inneren Struktur dieser früh- und mittelbronzezeitlichen Tellsiedlungen als auch der Gliederung der untersuchten Mikroregion im Mittelpunkt des Interesses. Zu diesem Zweck finden neben systematischen Surveys und geomagnetischer Prospektion Ausgrabungen an ausgesuchten Fundstellen statt; ebenso sind archäozoologische, geoarchäologische und archäobotanische Analysen in die Untersuchungen eingebunden.

2. Untersuchungen in Borosdivánka-Nagyhalom

Die Ausgrabungen im Rahmen dieses Projektes konzentrieren sich auf den Fundplatz von Borosdivánka-Nagyhalom, welcher inmitten der Borsod-Ebene auf einer kleinen "Insel" liegt, die durch künstliche Gräben von einer in ein einstiges Feuchtgebiet vorspringenden Landzunge abgeschnitten wurde (Abb. 1). Es handelt sich um eine bronzezeitliche Siedlung, die aus einem zentralen, mehrschichtigen Tell besteht, der von einem Graben umschlossen ist; außerhalb des Grabens – auf der gesamten südlich angrenzenden "Halbinsel" – liegt ein äußerer Siedlungsbereich. Ihm gegenüber wurden während der Bronzezeit zudem weitere Standorte genutzt, so dass eine clusterartige Siedlungsform entstand.

Seit 2015 finden archäologische Ausgrabungen auf dem Tell statt. In den ersten zwei Kampagnen (2015/2016) wurde zunächst mit Hilfe einer Sondage im östlichen Randbereich, die an der Stelle eines modernen, in den Tell hineingreifenden Schießstandes angelegt werden konnte, die Schichtenabfolge untersucht. Hierbei zeigten sich u. a. Reste eines mehrphasigen Hauses, ein darüber liegendes Schichtpaket aus – wie u. a. mikromorphologische Untersuchungen zeigen konnten (Röpke et al. 2016; Röpke et al. 2018) – Abfall- und Phytolithschichten; und auf diesem obenauf liegend erneut Reste eines Hauses. Anhand archäologischer Funde können diese Siedlungsschichten in die späte Füzesabony-Kultur datiert werden.



Abb. 1 Geländemodell von Borsodivánka-Nagyhalom. Die Lage des 2015/2016 untersuchten Profils liegt im östlichen Tell-Randbereich ("Schießstand").



Abb. 2 Profil im Ostbereich des Tells von Borsodivánka ("Schießstand").

Ausgehendend von den im Profil dokumentierten Befunden wurde 2017 der Grabungsschnitt auf eine Fläche von 5 x 5 m in Richtung Tellmitte erweitert.

3. Das archäobotanische Probenmaterial

Kampagnen 2015 und 2016

Während der Kampagnen in den Jahren 2015/ 2016 wurden u. a. aus der oberen Schuttschicht des älteren Hauses sowie aus den darüber liegenden Abfall- und Phytolithschichten, die als Aufträge oder eine Art Planierung gedeuteten werden können, neben kleinen Profilen für mikromorphologische Untersuchungen insgesamt 21 archäobotanische Bodenproben mit einem Gesamtvolumen von 116 l Sediment geborgen. Die Proben wurden während der Grabungskampagnen in Ungarn bzw. in Köln mit Analysesieben der Maschenweiten 0,315 mm und 1 mm geschlämmt. Die Untersuchung und Bestimmung der separierten pflanzlichen Großreste erfolgte im Labor für Archäobotanik des Kölner Instituts für Ur- und Frühgeschichte mit Hilfe einer Auflichtlupe mit bis zu 80facher Vergrößerung sowie der laboreigenen Vergleichssammlung.

In den Proben fanden sich knapp 3000 verkohlte und mineralisierte Pflanzenreste. Die Funddichten (Reste/Liter n/l) der einzelnen Proben erweisen sich mit Werten von 0,55 n/l bis

174,29 n/l als recht unterschiedlich, der Durchschnitt liegt bei 24,8 n/l. Am fundreichsten war hierbei die Probe aus Schicht S7 mit 174,3 n/l.

Das dokumentierte Kulturpflanzenspektrum ist das für die Mittelbronzezeit regional typische (vgl. Guylai 2010; Stika/Heiss 2013; Filatova 2022): Es fanden sich Reste von mehrzeiliger Spelzgerste (*Hordeum vulgare* ssp. *vulgare*, Abb. 3a), Einkorn (*Triticum monococcum*, Abb. 3d), Emmer (*Tr. dicoccon*) und Dinkel (*Tr. spelta*, Abb. 3b–c) sowie Diasporen von Linse (*Lens culinaris*, Abb. 3e), Erbse (*Pisum sativum*) und Leindotter (*Camelina sativa*). Auffallend häufig waren mineralisierte Pflanzenresten, wobei sie in Schicht S7 einen Anteil von über 3 % haben. In dieser Schicht fanden sich ferner Reste der Getreideverarbeitung (Druschreste, zumeist fragmentierte Getreidefrüchte, Getreideunkräuter) und Nachweise typischer Grünlandtaxa; hinzu kommt eine sehr hohe Anzahl (> 1000) an Fischschuppen. Die Zusammensetzung von S7 zeichnet diese Schicht als Abfallschicht aus, deren hoher Phosphatgehalt, welcher u. a. durch die mineralisierten Pflanzenreste und den in den mikromophologischen Dünnschliffen sichtbaren Apatit angezeigt wird, mit einem Eintrag von Dung erklärt werden kann.



Abb. 3: Verkohlte und mineralisierte Pflanzenreste aus Borsodivánka: a Spelzgerste (*Hordeum vulgare* ssp. *vulgare*, Karyopse), b und c Dinkel (*Triticum spelta*, Karyopse und Hüllspelzenbasis), d Einkorn (*Triticum monococcum*, Ährchengabel), Linse (*Lens culinaris*, Samen, mineralisiert). Maßstab 1 mm.

Kampagnen 2017 und 2018

Ab Kampagne 2017 konnte die Grabungsfläche Richtung Tellmitte erweitert werden (s. o.). Im Zuge dessen wurde vor Ort entschieden, eine systematische Beprobung jeder Schicht (jeweils ca. einen Eimer Sediment) während des Abtrages vorzunehmen; bei flächigen Schichten (wie S7) sollte aus jedem zweiten 1 x 1 m Quadranten ebenfalls eine Bodenprobe gesichert werden.

In den Jahren 2017 und 2018 wurden insgesamt 34 Bodenproben aus den oberen Tellschichten mit einem Gesamtvolumen von über 1701 Sediment geborgen, die alle während der Grabungen in Ungarn geschlämmt wurden. Allerdings sind von diesen Kampagnen ausschließlich die Proben aus 2017 (n = 21) aussagekräftig, da jene aus 2018 leider nicht fachgemäß aufbereitet wurden. Das Spektrum der gefundenen Pflanzenreste (2017: n = 2366; 2018: n = 107) bestätigt vorerst das Bild der vorangegangenen Kampagnen; zudem konnte wohl noch Nacktweizen (*Triticum* cf. *aestivum* s.l./*durum/turgidum*) sowie ein mehrere Hundert Samen umfassender Leindotter-Massenfund (aus S1014) dokumentiert werden.

Kampagnen 2020 und 2021

Aus der Kampagne im Jahr 2020 stammten insg. 48 Bodenproben, wobei alleine 14 aus der fundreichen Abfallschicht S7 geborgen wurden. Die Proben stammen vorwiegend aus verschiedenen Schichten eines Hausgrundrisses sowie der darunter liegenden Abfall- und Phytolithschichten (Abb. 3) und hatten ein Gesamtvolumen von rund 244 l Sediment. Weitere 18 Bodenproben mit einem Gesamtvolumen von über 73 l Sediment wurden während der Kampagne 2021 aus Schichtpaketen unterhalb der 2020 freigelegten Bereiche für eine archäobotanische Untersuchung geborgen.

Auf Grund logistischer Gründe erfolgte die Aufbereitung des Probenmaterials 2021 bzw. 2022 durch die archäologischen Fachfirma ArchaeoConnect in Tübigen.

Im Rahmen einer ersten Förderung durch die "Foundation for the Study and Preservation of Tells in the Prehistoric Old World" konnte im Jahr 2022 die Bearbeitung des Probenkonvoluts der Kampagne 2020 durchgeführt werden, wobei sowohl die ausgeschlämmten organischen Fraktionen, als die mineralischen Rückstände untersucht wurden. Dabei wurden insgesamt 4776 Pflanzenreste von 86 Taxa ausgelesen und bestimmt. Aus den Abfall- und Phytolithschichten unterhalb des Hausgrundrisses (Haus A) stammen dabei 89 % aller Funde (v.a. Kulturpflanzenreste). Das meiste Fundmaterial stammt dabei – wie auch schon in den vorangegangenen Untersuchungen – aus den Proben aus Abfallschicht S7 (insg. 3708 Reste). Mit Nachweisen von Gerste, Emmer, Einkorn, Dinkel, Nacktweizen, Linse, Erbse, Linse, Erbse und Leindotter fanden sich in den Proben alle schon aus den vorherigen Untersuchungen bekannt Taxa; neu sind Reste von Ackerbohne (*Vicia faba*).



Abb. 3 Innere Stratifizierung des Hauses A (oberhalb S6) und den darunter liegenden Pytholith- und Abfallschichten (ab S6 und darunter).

Die in Tübingen geschlämmten Proben aus Kampagne 2021 wurden im Herbst 2022 an das Kölner Labor geliefert und mit dem Auslesen des Materials wurde begonnen. Diese Arbeiten sowie die Bestimmung der separierten Pflanzenreste sollen 2023 abgeschlossen werden.

Kampagnen 2022 und 2023

Im Jahr 2022 wurden weitere 19 Bodenproben geborgen, die derzeit bei der Fachfirma ArchaeoConnect in Tübigen geschlämmt werden. Das Gesamtvolumen der Proben ist noch nicht bekannt, ebenso die Entnahmestellen der einzelnen Proben. Ferner ist für 2023 eine weitere – wahrscheinlich – abschließende Grabungskampagne geplant, bei der die verbleibenden Schichten des Tells untersucht werden sollen; aus diesen ist weiteres Bodenprobenmaterial zu erwarten.

4. Geplante archäobotanische Analysen und Kostenkalkulation

Wie eben dargelegt, stehen für eine Bearbeitung und umfassende Auswertung des wichtigen archäobotanischen Fundmaterials aus Borsodivánka-Nagyhalom im Jahr 2023 weitere Proben aus den Kampagnen 2021 und 2022 zur Verfügung. Aus der Grabungskampagne 2023 sind zusätzliche Sedimentproben zu erwarten.

Die Abfolge von mehrphasigen Hausgrundrissen sowie von Abfallschichten und Phytolithlagen konnte in dem seit 2017 freigelegten Siedlungsbereich großflächig erfasst und systematisch beprobt werden. Auf diese Weise können die archäobotanischen Analysen detaillierte Aussagen sowohl zur Wirtschaftsweise als auch zu den verschiedenen Aktivitätszonen (sowie deren Verlagerung) während der Besiedlungszeit des Tells liefern. Durch die zahlreich geborgenen Profilkästen für mikromorphologische Analysen ist zudem eine enge Verzahnung zwischen den mikromorphologischen und archäobotanischen Ergebnissen gewährleistet. Beispielhaft ist dies schon mit Proben aus dem Profilschnitt durchgeführt worden (Röpke et al. 2016; Zerl et al. 2016; Röpke et al. 2018; Zerl et al. 2022).

Die technischen Arbeiten (Auslesen und Bestimmen der Pflanzenreste) sowohl des schon vorhandenen als auch des noch zu erwartenden Probenmaterials werden vom Labor für Archäobotanik des Kölner Institutes für Ur- und Frühgeschichte übernommen.

Für die umfassende Auswertung aller archäobotanischen Fundspektren (aus den Jahren 2015–2023) sowie deren Vorlage im Rahmen einer wissenschaftlichen Publikation sind Kosten von insgesamt 12.000 € zu kalkulieren (3 Monate wissenschaftliche Mitarbeiterin 50 % für die Antragstellerin). Da diese Arbeiten in einem Zeitraum von 2 Jahren durchgeführt werden sollten, wurde schon im Vorjahr eine Förderung von 6000 € für das erste Jahr (2022) beantragt, welche im Januar 2022 bewilligt wurde.

Für die im zweiten Jahr (2023) vorgesehenen Arbeiten wird an dieser Stelle die zweite Teilförderung in Höhe von 6000 € beantragt.

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FOUNDATION FOR THE **STUDY** AND **PRESERVATION** OF **TELLS** IN THE PREHISTORIC OLD WORLD

Neuffenstraße 57 · D-73734 Esslingen am Neckar

Dr. Tanja Zerl Universität zu Köln Institut für Ur- und Frühgeschichte Labor für Archäobotanik Weyertal 125 D-50923 Köln

14.01.2023

Subject: Archäobotanische Untersuchungen in Borosdivánka-Nagyhalom (Ungarn)

Dear Dr. Zerl,

following the recent meeting of our boards, I would like to let you know that your proposal 'Archäobotanische Untersuchungen in Borosdivánka-Nagyhalom (Ungarn)' has found unanimous approval regarding the aims and the quality of your work proposed and your project's match with the purpose of the foundation's statutes.

We are pleased, therefore, to inform you that the foundation is ready to support your work in 2023 with funds amounting to **6.000** Euro for expenses as stated in your application and budget calculation.

Funding is subject to your written acceptance of our funding guidelines and general information for applicants attached to this letter. Please note, in particular, our invoicing regulations, and that we require receipts for all travel and material expenses *etc*. granted.

A final report and settlement on your work is to be submitted at the latest six weeks after expiry of the funding period, *i.e.* by February 2024.

Although we have taken note that your project is scheduled to be multi-annual, we kindly ask you to submit a follow-up application in case you should seek our support beyond the current funding period.

In our assessment of such a re-application we will certainly take the positive evaluation of your first proposal into consideration. However, please do note that, at this point, for legal and fiscal reasons we cannot commit ourselves to funding the continuation of those projects that will be supported in 2023, since our funding activity will depend on the means available and the applications that we receive. So please make sure to also be in touch with other funding agencies and to inquire alternative options for ensuring the continuity of your work.

Should you have any questions please do not hesitate to get in touch.

We wish you every success in your work on this project and remain with best regards, yours sincerely,

TUil

Prof. Dr. Tobias L. Kienlin (Chairman)

Attachment: Funding Guidelines and General Information for Applicants (2023 version)



UNIVERSITÄT ZU KÖLN

Universität zu Köln • Albertus-Magnus-Platz • 50923 Köln

Chairman of the Foundation for the Study and Preservation of Tells in the Prehistoric Old World Neuffenstraße 57 D-73734 Esslingen am Neckar

Der Kanzler

Dezernat Forschungsmanagment Abteilung **Nationale Förderung**

Anna Zölzer Telefon: +49 221 470-76262 a.zoelzer@verw.uni-koeln.de verwaltung.uni-koeln.de

Mittelabruf 2023 Archäobotanische Untersuchungen in Boroskivánka-Nagyhalom (Ungarn) FSPT-Bewilligung vom 14.01.2023

Köln, 02.11.2023

Sehr geehrte Damen und Herren,

wir bitten um Überweisung der bewilligten Mittel i. H. v. 6.000,00 €.

Bitte überweisen Sie die Mittel auf das nachstehende Bankkonto:

Universität zu Köln Sparkasse Köln/Bonn IBAN: DE44 3705 0198 1900 6948 35 BIC: COLSDE33XXX

Hinweis auf Überweisungsträger: D-76711-Z-679-142003394

Vielen Dank im Voraus.

Für Rückfragen stehe ich Ihnen gerne zur Verfügung.

Mit freundlichen Grüßen Im Auftrag

Anna Zölzer

Anschrift Albertus-Magnus-Platz 50923 Köln

Zentrale Telefon: +49 221 470-0

Zu erreichen mit KVB-Bahnlinie 9 KVB-Buslinien 130, 136, 142, 146

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FOUNDATION FOR THE **STUDY** AND **PRESERVATION** OF **TELLS** IN THE PREHISTORIC OLD WORLD

Förderrichtlinie 2024



FOUNDATION FOR THE **STUDY** AND **PRESERVATION** OF **TELLS** IN THE PREHISTORIC OLD WORLD

Funding Guidelines 2024



Funding Guidelines and General Information for Applicants 2024

What is the FSPT?

The Foundation for the Study and Preservation of Tells in the Prehistoric Old World (FSPT), established in 2021, is a legal foundation under civil law based in Esslingen am Neckar, Germany, that promotes archaeological research and cultural heritage, especially in the field of settlement archaeology. Specifically, the foundation's purpose is to further the preservation and archaeological research of prehistoric settlement mounds (tells) in the Old World, including their surrounding outer settlements and settlement systems as well as associated cultural phenomena such as cemeteries, *etc.* Apart from fieldwork, the processing and publication of pertinent data, theoretical work is particularly eligible for support that, from a perspective of cultural studies, deals with the understanding of the specific constancy of place and the reference to tradition, the specific materiality and the organisation of social space of prehistoric tell cultures.

What is eligible for support?

The purpose of the foundation's statutes may be achieved in particular through the following measures:

• carrying out archaeological fieldwork and its evaluation including the application of relevant scientific methods (environmental reconstruction, geophysical prospecting, C14 dating, *etc.*),

• acquisition and long-term maintenance of land and protection of prehistoric tell settlements (possibly including their outer settlement),

• implementation of protective measures for archaeological sites of settlement mounds (possibly including their outer settlement), for example long-term leasing or compensation to farmers to remove land from agricultural use,

• promotion of the application and development of non-destructive methods in tell research (geophysics, drilling, *etc.*),

• funding of research projects and work by domestic and foreign scholars who, with an explicitly theoretical orientation and the perspective of cultural studies, devote themselves to the understanding of the characteristic local constancy and reference to tradition, the specific materiality and organisation of social space of prehistoric tell cultures,

• assignment of research grants to domestic and foreign scholars to carry out corresponding work (*e.g.* final theses at master's or dissertation level, book or other publication projects),

• implementation or support of conferences or workshops including the publication of their proceedings,

• support of field projects (also in co-financing), that promise to make a significant contribution to the goals of the foundation formulated at the beginning through the acquisition of new finds and findings

• funding – in exceptional cases – archaeological work and projects of high relevance without direct reference to prehistoric tell cultures.

The above examples are not exhaustive, and the foundation can also take other measures that are suitable for promoting the foundation's purpose. The foundation does not have to pursue all measures simultaneously and to the same extent. There is no legal entitlement to benefits from the foundation. Even with the award of benefits, no actionable claim to a benefit is established. Claims to benefits also do not arise from the principle of equal treatment.

Funding available in 2024 and schedule

For the year 2024 the foundation invites applications for individual projects and other activities related to its purpose up to the amount of max. **20,000 Euro** per annum.

In view of the tense political and economic situation, the foundation's maximum funding amount is limited. Applicants cannot assume that their projects can be fully funded and may please seek funding for their projects elsewhere as well. This applies in particular to multiyear projects, whose one-off funding cannot automatically result in funding for subsequent years. For an overview of the projects supported so far, please see our homepage: https://foundationstprte.de

Should you envisage a multi-annual project and require funding in subsequent years please do state this clearly in your first application, alongside an approximation of the funding required in the future. In the event of a grant, we will kindly ask you to submit a follow-up application in case you should seek our support beyond the current funding period. In our assessment of such a re-application we will certainly take the positive evaluation of your first proposal into consideration. However, please do note that for legal and fiscal reasons we cannot commit ourselves to funding the continuation of your project, since our funding activity will depend on the means available and the applications that we receive. So please make sure to also be in touch with other funding agencies and to inquire alternative options for ensuring the continuity of your work.

The deadline for applications is **30 November 2023**.

The funding decision will be made during the annual meeting of the foundation's executive and advisory boards in **late January or early February 2024** and communicated to the applicants accordingly.

In order to save prospective applicants the time and effort involved with the preparation of a formal grant application, if you feel there is a good match between your project and our aims outlined above, we invite you to contact us with a concise letter of interest providing some basic information about your plans. If your letter of interest is of interest to us, you will be invited to submit a full proposal.

Applicants will typically be domestic and foreign scholars with a proven record of pertinent experience in tell studies, junior researchers with a strong motivation and plausible interest in the field, as well as legal persons or public bodies that pursue a project suitable for promoting the foundation's purpose, *e.g.* the implementation of protective measures for archaeological sites. The members of the foundation bodies, *i.e.* the executive board and the advisory board, are eligible to apply. A maximum of 50% of the annual funding amount may be spent on projects involving or in conjunction with members of the executive board.

Application documents

Proposals may be written in English or German.

The following documents must be included in an application for a research project:

• description of the research proposal (max. 10 pages plus bibliography as required; please use a readable font, *e.g.* Arial 11 pt. or Times New Roman 12 pt. and line spacing 1.5)

- time schedule, travel itinerary (as applicable)
- detailed cost calculation (specific funds being applied for must be precisely defined, *e.g.* travel expenses, material expenses; no college or tuition fees; no overhead costs)
- curriculum vitae and list of publications of the applicant(s)
- if needed, curriculum vitae and list of publications of the proposed cooperating partner(s) in the project

• any documents required to prove the feasibility of the proposed project (excavation permits, letters of confirmation, *etc.*)

If also a scholarship for the applicant is planned:

- at least one letter of recommendation (signed personally by the author)
- academic certificates of the applicant (Bachelor, Masters, PhD, professorship, etc.)

Please ensure that your application documents are complete and submit only those documents as requested.

Please submit your application electronically only in **pdf format** to <u>foundationstprte@gmail.com</u>.

Invoicing travel and material expenses

The foundation is employing a pre-financing and reimbursement system. Receipts shall be provided as evidence of all travel expenses and materials bought. There is no need for any such expenses to be justified in detail if receipts have been provided. Should it not be possible to provide a receipt for a particular cost incurred, the foundation expects a detailed explanation to be provided. The refunding of any such funds is then at the Foundation's discretion.

Travel expenses and hotel expenses shall be settled upon presentation of receipts.

In addition to the provision of receipts, the foundation requests that a list of all expenditures be provided, with all receipts allocated a number for the purposes of easy identification. The invoiced sum should be subdivided according to travel and material expenses.

Please convert all expenses into euros using the exchange rate of the day in question. This exchange rate should be provided in the invoice.

Scholarships

The simultaneous receipt of salary *etc.* and a scholarship is not possible. The funding period for PhD scholarships normally is up to two years. In justified cases, the scholarship period can be extended for up to 12 months if an extension application is made before the end of the second year of funding.

Monthly PhD scholarship award: 1,600 euros Travel aid: as required Material aid: as required

Research Scholarships for Postdocs: Monthly scholarship award: 2,300 euros Travel aid: as required Material aid: as required

There shall be no employment relationship between the foundation and the grant recipient; as such, the foundation shall not be liable for social security costs. The foundation recommends that the grant recipient takes out private medical insurance. The foundation cannot make any contributions towards this.

General terms and conditions of acceptance

Scholarships and other support funding provided can in justified individual cases also be disbursed to the institutions involved in the project. The foundation will not conclude any further contracts with partners receiving support or their institutions over and above the grant approval letter itself.

On accepting the grant, the grant recipient is obliged to inform the foundation without delay of any changes which may have a bearing on the granting of the funding or the sum of the grant.

Subsequent to funding for the purposes of completing a doctorate, the foundation requests that it be informed as to whether a doctorate was conferred and with what grade, and also requests that a copy of the (provisional) PhD certificate be provided.

Reports and publications

Interim reports are to be submitted six weeks before the first full year of funding expires. The report should give details of the progress made in the first year of funding including provisional results and future project plans. The foundation shall not provide any guidelines concerning the length of the report.

Final reports are to be submitted at the latest six weeks after expiry of the funding period. The foundation shall not provide any guidelines concerning the length of the report.

The foundation requests that it please be informed in advance about any publications resulting from funding awarded. The foundation shall receive two specimen copies of each book publication (monograph / collection of essays) and possibly three further copies on request, as well as one offprint of every article that is published.

Please always seek to ensure mention of the funding received (including in any press releases published).

We request that press clippings and recordings of radio or television coverage/reports (incl. the date, source and reference number provided in each case) be sent to the foundation immediately after publication/broadcasting/posting. Should press coverage have taken place, publications have come out, or reports have been broadcast/posted during the funding period, we request that you list these in your interim and final reports.

Revocation

The foundation reserves the right to revoke a grant/the granting of project funds and to make a claim for reimbursement if

• the terms of appropriation are not adhered to or the foundation has other good reason for revoking its grant

- the grant was obtained on the basis of incorrect or incomplete details
- conditions imposed by the foundation are not met at all or are not met within the deadlines set by the foundation
- the grant has not been claimed one year after having been awarded and no reason has been given for this
- the funds have not been used for the direct purpose stated
- the funds have not been accounted for in time, as agreed or completely.