

# ŚWIATOWIT

ROCZNIK

POŚWIĘCONY ARCHEOLOGII PRZEDDZIEJOWEJ

I BADANIOM

pierwotnej kultury polskiej i słowiańskiej

WYDAWANY STARANIEM

ERAZMA MAJEWSKIEGO.

**Tom I. — 1899.**

(57 ilustracyi w tekście i XI tablic).

WARSZAWA.

Skład Główny w Księgarni E. Wendego i S-ki, Krak.-Przedmieście № 9.

—  
1899.

# ŚWIATOWIT

ANNUAL OF THE INSTITUTE OF ARCHAEOLOGY  
OF THE UNIVERSITY OF WARSAW

VOL. XIII–XIV (LIV–LV)  
(2015–2016)

FASCICLE A/B

PREHISTORICAL AND MEDIEVAL  
ARCHAEOLOGY.  
ARCHAEOLOGY OF POLAND

MEDITERRANEAN  
AND NON-EUROPEAN  
ARCHAEOLOGY



WARSAW 2018

# ŚWIATOWIT

ROCZNIK INSTYTUTU ARCHEOLOGII  
UNIwersytetu Warszawskiego

TOM XIII–XIV (LIV–LV)  
(2015–2016)

FASCYKUŁ A/B

ARCHEOLOGIA PRADZIEJOWA  
I ŚREDNIOWIECZNA.  
ARCHEOLOGIA POLSKI

ARCHEOLOGIA  
ŚRÓDZIEMNOMORSKA  
I POZAEUROPEJSKA



WARSZAWA 2018

Redaktor naczelny Wydawnictw Instytutu Archeologii UW: Krzysztof Jakubiak

# ŚWIATOWIT

## ROCZNIK INSTYTUTU ARCHEOLOGII UNIwersYTETU WARSZAWSKIEGO

Redaktorzy: Dariusz Błaszczuk (d.blaszczuk@uw.edu.pl),  
Jerzy Żelazowski (j.r.zelazowski@uw.edu.pl)

### **Rada redakcyjna:**

Włodzimierz Godlewski (Przewodniczący)  
Elżbieta Jastrzębowska  
Joanna Kalaga  
Wojciech Nowakowski  
Tadeusz Sarnowski  
Tomasz Scholl  
Karol Szymczak

### **Recenzenci tomu:**

Zdzisław Bełka, Uniwersytet im. A. Mickiewicza w Poznaniu  
Joanna Kalaga, Uniwersytet Warszawski  
Piotr Kittel, Uniwersytet Łódzki  
Henryk Kobryń, Szkoła Główna Gospodarstwa Wiejskiego w Warszawie  
Jerzy Libera, Uniwersytet Marii Curie-Skłodowskiej w Lublinie  
Andrzej Michałowski, Uniwersytet im. A. Mickiewicza w Poznaniu  
Michał Pawleta, Uniwersytet im. A. Mickiewicza w Poznaniu  
Jan Schuster, Uniwersytet Łódzki

All rights reserved  
© 2018 Instytut Archeologii Uniwersytetu Warszawskiego

ISSN 0082-044X

Projekt okładki, opracowanie graficzne i skład: Jan Żabko-Potopowicz  
Druk:

Adres redakcji: Instytut Archeologii Uniwersytetu Warszawskiego,  
Krakowskie Przedmieście 26/28, 00-927 Warszawa

# Spis treści

---

## Contents

### Fascykuł A/B

ARCHEOLOGIA PRADZIEJOWA I ŚREDNIOWIECZNA. ARCHEOLOGIA POLSKI  
ARCHEOLOGIA ŚRÓDZIEMNOMORSKA I POZAEUROPEJSKA

### Fascicle A/B

PREHISTORICAL AND MEDIEVAL ARCHAEOLOGY. ARCHAEOLOGY OF POLAND  
MEDITERRANEAN AND NON-EUROPEAN ARCHAEOLOGY

OD REDAKCJI.....	9
------------------	---

---

## Studia i materiały

### Katarzyna Januszek, Katarzyna Pyżewicz

KRZEMIENNE NARZĘDZIA SZLIFOWANE Z PÓŹNEGO NEOLITU – MIĘDZY FORMĄ A FUNKCJĄ .....	13
Late Neolithic polished flint tools – between form and function .....	27

### Sylwia Domaradzka, Bartosz Józwiak, Michał Przeździecki

MATERIAŁY Z EPOKI KAMIENIA I WCZESNEJ EPOKI BRĄZU ZE STANOWISKA 2 W WOŹNEJWSI, GM. RAJGRÓD, WOJ. PODLASKIE Z BADAŃ W LATACH 2015–2016 .....	29
Stone Age and Early Bronze Age archaeological material from the site 2 in Woźnawieś, Rajgród commune, Podlaskie voivodship, from the excavations in 2015 and 2016 .....	46

### Agata Trzop-Szczypiorska, Radosław Karasiewicz-Szczypiorski

DOMY ZE STANOWISK KULTURY PRZEWORSKIEJ NA MAZOWSZU. KILKA PRZYKŁADÓW Z NIEPUBLIKOWANYCH BADAŃ .....	47
Houses from sites of the Przeworsk Culture in Masovia. A few examples from unpublished research .....	70

### Agata Chilińska-Früboes, Bartosz Kontny

PO JANTAR! RZYMSKI TROP W DALEKIM KRAJU ALBO RAZ JESZCZE O ZNALEZISKACH Z DAWNEGO <i>ILISCHKEN</i> .....	73
Go for amber! Roman trace in a distant land or once more about old finds from former <i>Ilischken</i> .....	105

### **Dominik Chudzik**

WYBRANE ASPEKTY WCZESNOŚREDNIOWIECZNEGO OSADNICTWA RÓWNINY ŁUKOWSKIEJ I WYSOCZYNY SIEDLECKIEJ .....	107
Selected Aspects of Early Medieval Settlement in the Łuków Plain and the Siedlce Upland .....	131

### **Dariusz Błaszczuk**

POCHODZENIE I DIETA MĘŻCZYZNY POCHOWANEGO W GROBIE D162 Z CMENTARZYSKA W BODZI W ŚWIEŹLE BADAŃ IZOTOPOWYCH.....	133
The provenance and diet of a man buried in the grave D162 from the cemetery in Bodzia in the light of isotopic analyses .....	155

### **Joanna Piątkowska-Malecka**

ZWIERZĘCE SZCZĄTKI KOSTNE Z TERENU ŚREDNIOWIECZNEJ OSADY W SURAZU, STAN. 7/125, GM. <i>LOCO</i> , POW. BIAŁOSTOCKI, WOJ. PODLASKIE .....	159
Animal skeletal remains from the medieval settlement in Suraz, site 7/125, Suraz commune, Białystok district, Podlaskie voivodship .....	174

### **Marta Osypińska, Joanna Piątkowska-Malecka**

ZWIERZĘTA W ZAGRODACH NA TERENIE OSADY LUDNOŚCI KULTURY CERAMIKI WSTĘGOWEJ RYTEJ W LUDWINOWIE (STAN. 7, AUT. 112), GMINA I POWIAT WŁOCŁAWEK .....	175
Homestead Animals in Linear Pottery Culture Settlement in Ludwinów (Site 7, Aut 112), Włocławek Commune and District .....	193

### **Sławomir Wadył, Marek Krąpiec**

DENDROCHRONOLOGIA O DATOWANIU WCZESNOŚREDNIOWIECZNEGO GRODZISKA W WĘGIELSZTYNIE, GM. WĘGORZEWO .....	195
Dendrochronology on the dating of an early medieval settlement in Węgielsztyn, Węgorzewo commune .....	203

### **Agnieszka Olech**

SYSTEM OCHRONY I PRZECHOWYWANIA ZABYTKÓW ARCHEOLOGICZNYCH NA SŁOWACJI.....	205
System for Protection and Storage of Archaeological Collections in Slovakia.....	212

---

## **Kronika wykopalisk**

### **Michał Przeździecki, Elżbieta Ciepielewska**

RYDNO – STANOWISKO NOWY MŁYN, WYKOP I/2015, WOJ. ŚWIĘTOKRZYSKIE. BADANIA W ROKU 2015 .....	215
Rydno – Site: Nowy Młyn, Cut I/2015, Świętokrzyskie voivodship. The excavations in 2015 .....	218

## **Paweł Szymański**

CZERWONY DWÓR, STAN. XXI, WOJ. WARMIŃSKO-MAZURSKIE. BADANIA W ROKU 2015 .....	221
Czerwony Dwór, site XXI, Warmińsko-Mazurskie voivodship. The excavations in 2015.....	226

## **Artur Brzóska, Piotr Prejs**

BADANIA NIEINWAZYJNE DNA WISŁY NA ODCINKU MOSTU ŚWIĘTOKRZYSKIEGO DO MOSTU GDAŃSKIEGO, WARSZAWA, WOJ. MAZOWIECKIE, BADANIA W LATACH 2015–2016 .....	227
Non-invasive Survey of the Bottom of the Vistula River Between the Świętokrzyski Bridge and the Gdański Bridge, Warsaw, Mazowieckie Voivodship, in the Years 2015 and 2016 .....	230

## **Ewa Marczak-Łukasiewicz**

TRUSZKI-ZALESIE, STANOWISKO 1 „OKOP” I STANOWISKO 3 „SIEDLIŚKO”, WOJ. PODLASKIE. BADANIA WYKOPALISKOWE W LATACH 2013, 2015 I 2016 .....	231
Trzuski-Zalesie, Site 1 (‘Okop’) and Site 3 (‘Siedlisko’), Podlaskie voivodship. Excavations in 2013, 2015, and 2016.....	233

## **Magdalena Natuniewicz-Sekuła**

WEKLICE, STAN. 7, POW. ELBLĄSKI, WOJ. WARMIŃSKO-MAZURSKIE. BADANIA W LATACH 2015–2016 .....	235
Weklice, Site 7, Elbląg district, Warmińsko-Mazurskie voivodship. The excavations in 2015–2016 .....	240

## **Michał Starski**

PUCK, UL. 1 MAJA 3, DZ. 168, BADANIA W LATACH 2014–2015 .....	241
Puck, 1 Maja Street no. 3, Plot 168. The excavations in 2014 and 2015 .....	248

## **Michał Starski**

SKARSZEWY – RYNEK, GM. SKARSZEWY, WOJ. POMORSKIE, BADANIA W 2015 ROKU .....	249
Skarszewy – the market square, Skarszewy commune, Pomorskie voivodship. The excavations in 2015 .....	258

## **Sławomir Wadył**

PASYM, ST. 1, WOJ. WARMIŃSKO-MAZURSKIE. BADANIA W ROKU 2016 .....	259
Pasym, site 1, Warmińsko-Mazurskie voivodship. The excavations in 2016 .....	265

## **Sławomir Wadył, Jerzy Łapo**

PERŁY, ST. 1, WOJ. WARMIŃSKO-MAZURSKIE. BADANIA W ROKU 2016 .....	267
Perły, site 1, Warmińsko-Mazurskie voivodship. The excavations in 2016 .....	270

## **Witold Gumiński**

STANOWISKO TORFOWE ŁOWCÓW-ZBIERACZY Z EPOKI KAMIENIA. SZCZEPANKI, STAN. 8, WOJ. WARMIŃSKO-MAZURSKIE. BADANIA W ROKU 2016 .....	271
Szczepanki, site 8, Warmian-Masurian voivodship – a Stone Age peat-bog site of hunter-gatherers. The excavations in 2016 .....	278

**Bartosz Kontny, Artur Brzóska, Anna Bucholc, Bartłomiej Kujda, Piotr Prejs**

Z POWIETRZA, LĄDU I WODY. WSZECHSTRONNA WERYFIKACJA OSIEDLI NAWODNYCH MIKROREGIONU JEZIOR ORZYSZ I WYLEWY. BADANIA W ROKU 2016 .....	279
From the air, land and water. A comprehensive verification of lake settlements of the microregion of the Orzysz and Wylewy lakes. The expedition in 2016.....	288

**Andrzej Szela**

BRUDNICE, ST. V, POW. ŻUROMIŃSKI. BADANIA WYKOPALISKOWE W SEZONIE 2015 .....	289
Brudnice, site V, Żuromin district. The excavations in 2015 .....	293

**Andrzej Szela**

BRUDNICE, ST. V, POW. ŻUROMIŃSKI. BADANIA WYKOPALISKOWE W SEZONIE 2016 .....	295
Brudnice, site V, Żuromin district. The excavations in 2016 .....	298

**Roksana Chowaniec**

PALAZZO ACREIDE, SICILY, ITALY. EXCAVATIONS IN 2015 .....	299
Palazzolo Acreide, Sycylia, Włochy. Wykopalka w 2015 r. ....	305

**Rosa Lanteri, Marta Fituła**

ANCIENT SETTLEMENTS IN THE TERRITORY OF NOTO (SYRACUSE PROVINCE): NEW DATA FROM THE GIOI AND NIURA DISTRICTS .....	307
Insedimenti Antichi nel Territorio di Noto (Provincia di Siracusa). Nuovi Dati Dalle Contrade "Gioi" e "Niura". ....	316
Ślady osadnictwa starożytnego terytorium Noto (prowincja Syrakuzy). Nowe znaleziska z „Contrada Gioi” i „Niura” .....	319

**Tadeusz Sarnowski, Agnieszka Tomas, Tomasz Dziurdzik,  
Ludmiła A. Kovalevskaya, Emil Jęczmienowski, Piotr Zakrzewski**

NOVAE 2015. LEGIONARY DEFENCES AND EXTRAMURAL SETTLEMENT .....	321
Prace wykopaliskowe w Novae w 2015 r. Twierdzy legionowa i osiedle przyobozowe. ....	327

**Martin Lemke**

FIELDWORK AT NOVAE 2015 .....	329
Wykopalka w Novae w 2015 r. ....	335

**Martin Lemke**

FIELDWORK AT NOVAE 2016 .....	337
Wykopalka w Novae w 2016 r. ....	342

**Martin Lemke**

FIELDWORK AT RISAN 2015 .....	343
Wykopalka w Risan w 2015 r. ....	348



**Martin Lemke**

FIELDWORK AT RISAN 2016 .....	349
Wykopaliska w Risan w 2016 r. ....	354

**Tomasz Dziurdzik**

LJUBŠKI ARCHAEOLOGICAL PROJECT: A ROMAN AND LATE ANTIQUE SETTLEMENT IN WESTERN HERZEGOVINA, 2015 .....	355
Projekt archeologiczny Ljubuški (Ljubuški Archaeological Project) – osadnictwo okresu rzymskiego i późnoantycznego w zachodniej Hercegowinie, 2015 r. ....	363

**Marcin Matera, Paweł Lech, Elżbieta Sroczyńska**

TANAIS, RUSSIA. EXCAVATIONS IN THE 2015 SEASON .....	365
Tanais, Rosja. Wykopaliska w sezonie 2015 .....	371

**Marcin Matera, Paweł Lech, Elżbieta Sroczyńska**

TANAIS, RUSSIA. EXCAVATIONS IN THE 2016 SEASON .....	373
Tanais, Rosja. Wykopaliska w sezonie 2016 .....	380

**Dmytro Nykonenko, Marcin Matera, Miron Bogacki, Wiesław Małkowski, Paweł Lech**

KONSULOVSKOE HILLFORT, UKRAINE. NON-INVASIVE SURVEY IN 2015 SEASON .....	381
Grodzisko Konsułowskoje, Ukraina. Badania nieinwazyjne w sezonie 2015 .....	388

**Dmytro Nykonenko, Marcin Matera, Nadieżda Gawryluk, Paweł Lech**

KONSULOVSKOE HILLFORT, UKRAINE. 2016 SEASON .....	389
Grodzisko Konsułowskoje, Ukraina. Badania w sezonie 2016 .....	392

**Barbara Kaim, Nazarij Buławka**

THE SIXTH SEASON OF EXCAVATIONS AT GURUKLY DEPE, SOUTHERN TURKMENISTAN (2015) .....	393
Szósty sezon wykopalisk na stanowisku Gurukly Depe w południowym Turkmenistanie (2015) .....	388

**Włodzimierz Godlewski**

NAQLUN, EGYPT. EXCAVATIONS IN 2015 .....	399
Naqlun, Egipt. Wykopaliska w 2015 r. ....	402

**Dorota Dzierzbicka, Włodzimierz Godlewski**

DONGOLA, SUDAN – SEASON 2015–2016 .....	403
Dongola, Sudan – Sezon 2015–2016 .....	412

**Joanna Kalaga**

RECENZJA: DARIUSZ BŁASZCZYK, DĄBRÓWKA STĘPNIOWSKA (RED.), *POCHÓWKI  
W GROBACH KOMOROWYCH NA ZIEMIACH POLSKICH W OKRESIE WCZESNEGO  
ŚREDNIOWIECZA*, ŚWIATOWIT, SUPPLEMENT SERIES P: PREHISTORY AND MIDDLE AGES,  
VOL. XVIII, WARSZAWA 2016, 175 STRON, 93 ILUSTRACJE, 3 TABELLE ..... 415

DMYTRO NYKONENKO, MARCIN MATERA, MIRON BOGACKI, WIESŁAW MAŁKOWSKI,  
PAWEŁ LECH

## KONSULOVSKOE HILLFORT, UKRAINE. NON-INVASIVE SURVEY IN 2015 SEASON

The Konsulovskoe site belongs to a group of the so-called Late Scythian/post-Scythian (GAVRILYUK, KRAPIVINA 2005: 66) hillforts situated along the banks of the lower sections of the Dnieper River (NIKONENKO 2015: 91; GAVRILŮK 2013: 556). The hillfort is situated on the right bank of a steep slope of a high plateau about 1 kilometre from the today's village of Respublikanets (Ukraine, Zaporozhe). This site has never been explored on a regular basis. The identified components of the hillfort are the citadel, as well as close and distant suburbs.

An expedition of the National Reserve 'Khortytsya' started the research of the Konsulovskoe hillfort in 2014 (NIKONENKO 2015: 91). Since 2015, the investigation of the network of lower Dnieper hillforts has been realised as a joint project in cooperation between archaeologists from Ukraine and the Institute of Archaeology as well as the Antiquity of Southeastern Europe Research Center at the University of Warsaw.

Fieldworks in 2015 were conducted between the 10<sup>th</sup> of August and the 10<sup>th</sup> of September. The non-invasive survey of the Konsulovskoe hillfort included aerial photography, topographical measurements, and geophysical prospection with the use of magnetic and electrical resistivity measurements. The first archaeological verification of the results of the non-invasive survey was also executed in the area of the newly-set Trench I.

Up to date, such non-invasive survey has been performed only on the territory of one hillfort called Chervonyi Mayak, localised about 8 kilometres to the south of the Konsulovskoe site (GAVRILŮK, SMEKALOVA, ČUDIN 2009: 90–94). Therefore, no complete standardized procedure of geophysical prospection for this kind of sites was available which could be applied to the Konsulovskoe fieldworks. Instead, the researchers from the University of Warsaw prepared a new method which combined electrical, magnetic, and aerial survey. Promising results of the first researches on the Konsulovskoe hillfort seem to confirm that this method is indeed the most appropriate.

### Aerial photography and topographical survey

The first rough plans of the Konsulovskoe site were included on Russian military maps compiled in the mid-19<sup>th</sup> century (NIKONENKO 2015: 92). A more detailed topographical plan of the hillfort (Fig. 1) was drawn and published

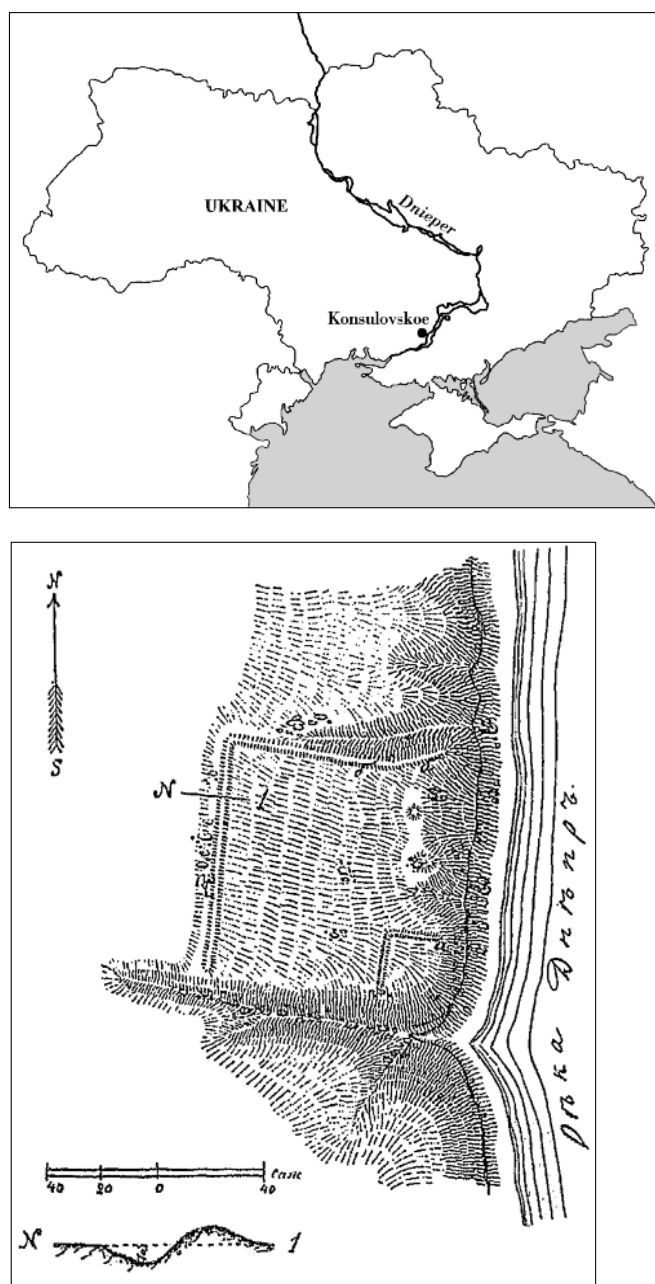


Fig. 1. Konsulovskoe hillfort. The topographical plan compiled by V.I. Goschkevich (after V.I. GOŠKEVIČ, *Letopis' muzeâ za 1909, 1910 i 1911 gg.*, Hersonskij Gorodskoj Muzej Drevnostej 2, HERSON 1912, 8, fig. 3).

Ryc. 1. Grodzisko Konsułowskoje. Plan topograficzny wykonany przez W.I. Goszkiewicza (wg V.I. GOŠKEVIČ, *Letopis' muzeâ za 1909, 1910 i 1911 gg.*, Hersonskij Gorodskoj Muzej Drevnostej 2, HERSON 1912, 8, fig. 3).

by V.I. Goschkevich in 1912 (GOŠKEVIČ 1912: 8, fig. 3). A modern plan (Fig. 2) was prepared by D.D. Nykonenko (NIKONENKO 2015: 94, fig. 3, 2). Despite their significance and many interesting details, it was decided that it would be appropriate to verify the results of the previous works. The first stage of the non-invasive survey consisted of drawing photogrammetric documentation on the basis of aerial photography and GPS measurements carried out for this purpose.

The topographic survey was performed automatically during magnetic survey and consisted of levelling measurements with the use of the GPS RTK system. A GPS device was also used to determine accurate position of the photopoints used to adjust kite aerial photographs.

The aerial photography was made with the use of a camera suspended to a kite on a special remotely-controlled self-levelling frame with a Picavet-type suspension (ABER). The method of aerial photography with the use of such devices was developed by Miron Bogacki in 2006 and tested at multiple archaeological sites. The aim of these works

was to draw photographic documentation of the whole area of the site. During several sessions nearly 1200 oblique and vertical photographs were taken. This enabled preparing the Digital Terrain Model (Fig. 3) and ortophotomaps. A visualisation of the obtained results was compiled in the Photoscan Pro 1.1.6 software.

## Geophysical survey

The magnetic prospection was carried out with a Geometrics G-858G caesium magnetometer with two sensors in horizontal configuration. It was performed on the area of 2.5 hectares. This solution enabled taking measurements of the total vector of magnetic field intensity and, at the same time, determining the value of the pseudo-gradient of its horizontal components. As a result of the measurements, two maps presenting the distribution of magnetic anomalies were prepared: the map of the values of the total vector of magnetic field intensity, and another one of the values of the pseudo-gradient of the horizontal component

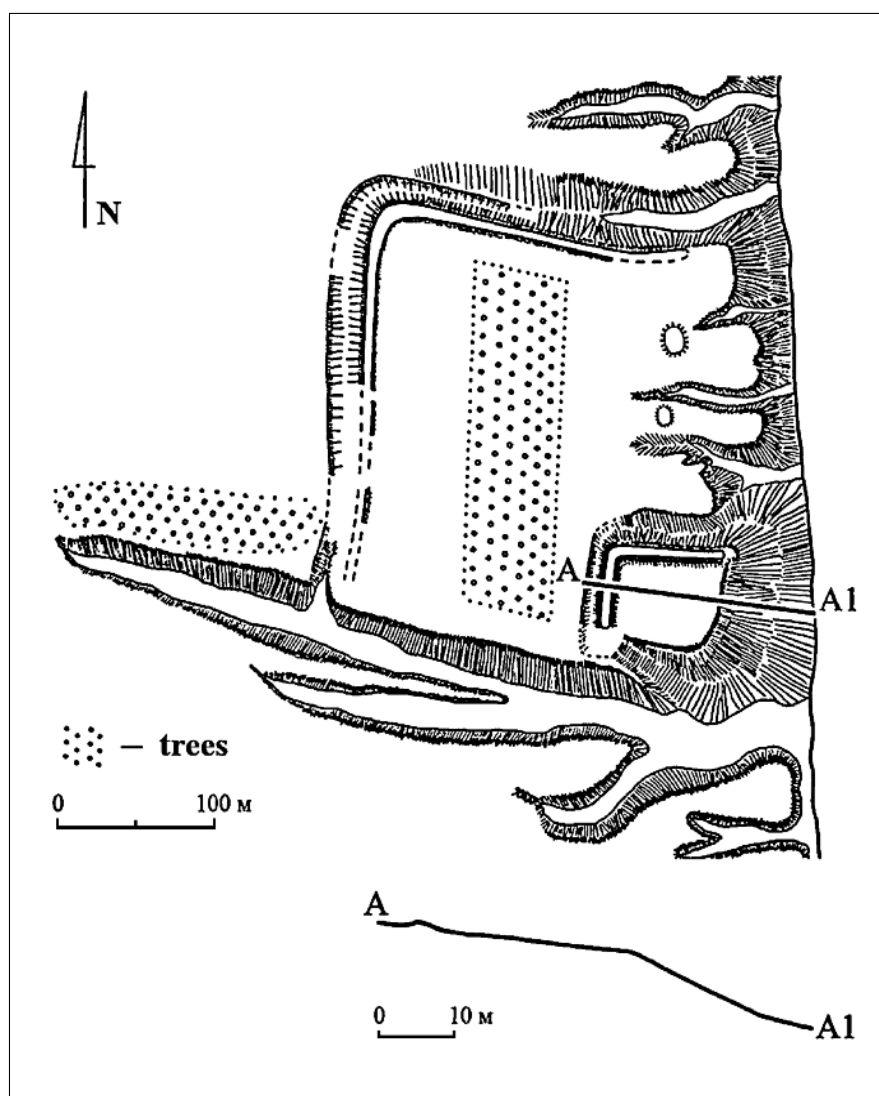


Fig. 2. Konsulovskoe hillfort. The topographical plan compiled by D.D. Nykonenko (after D.D. NIKONENKO, *Pizn'oskifs'ke Konsulov'ske gorodiše*, „Arheologia” 2015/1, 94, fig. 3,2).

Ryc. 2. Grodzisko Konsulowskoje. Plan topograficzny wykonany przez D.D. Nykonenko (wg D.D. NIKONENKO, *Pizn'oskifs'ke Konsulov'ske gorodiše*, „Arheologia” 2015/1, 94, fig. 3,2).

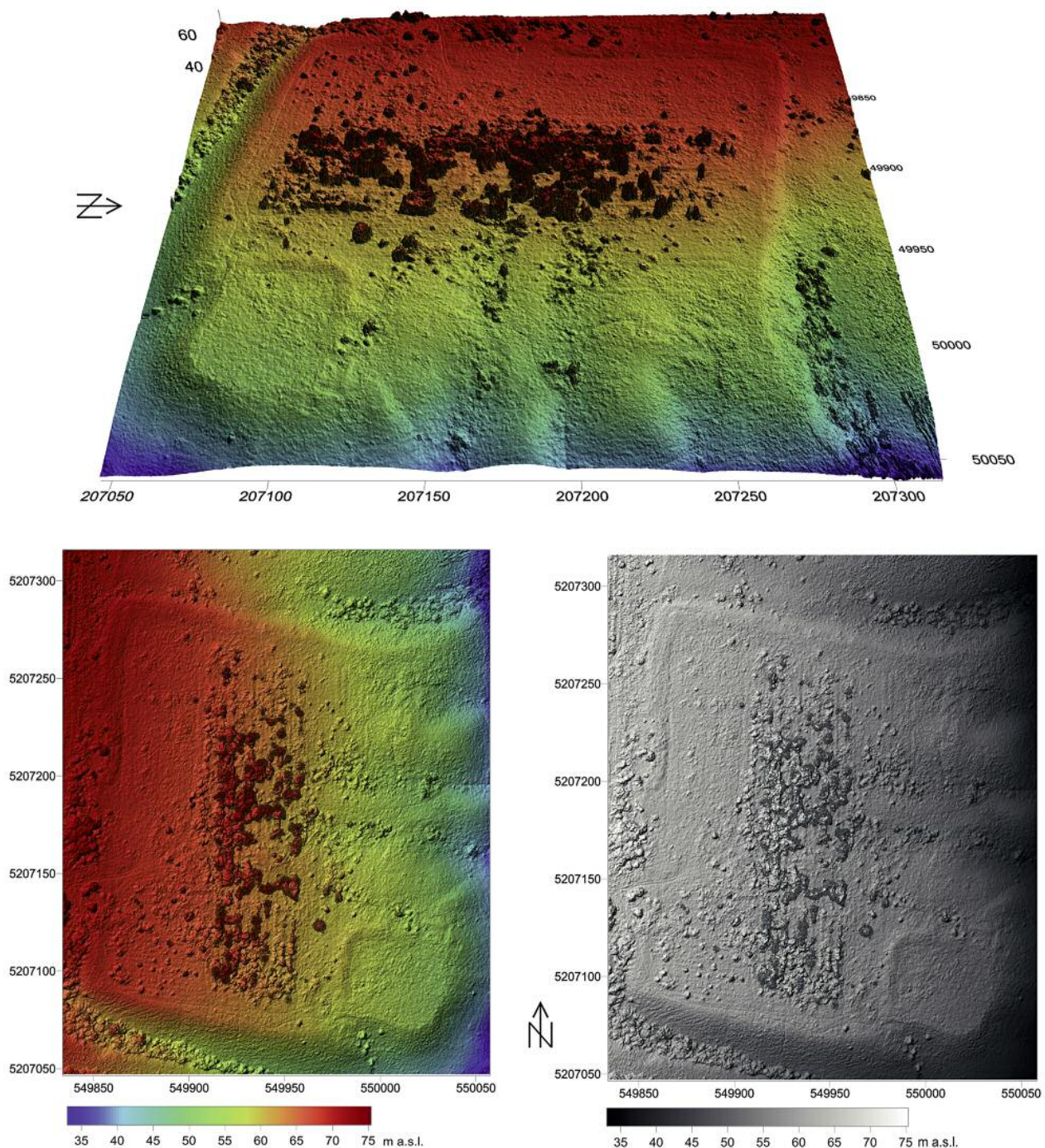


Fig. 3. Konsulovskoe hillfort. The Digital Terrain Model (compiled by M. Bogacki).

Ryc. 3. Grodzisko Konsulowskoje. Numeryczny model terenu (oprac. M. Bogacki).

of the total vector of magnetic field intensity (**Fig. 4**). The dipole anomalies visible on the maps occurred irregularly throughout the whole investigated area and could be caused by single metal objects present in the subsurface layers.

Two concentrations of dipole-dipole anomalies are visible in the western part of the investigated area: I and II (**Fig. 5**). The range of values of the total vector of magnetic

field intensity on the surveyed field exceeded 100nT. It may indicate the presence of iron artefacts or heavily-burnt materials. However, it cannot be excluded that modern human activities could produce this effect. Anomaly III has a similar character (**Fig. 5**).

Most likely the linear anomalies indicated on the map as IV, V, VI, VII, and VIII (**Fig. 5**) were caused by remains of the western line of fortifications. However the



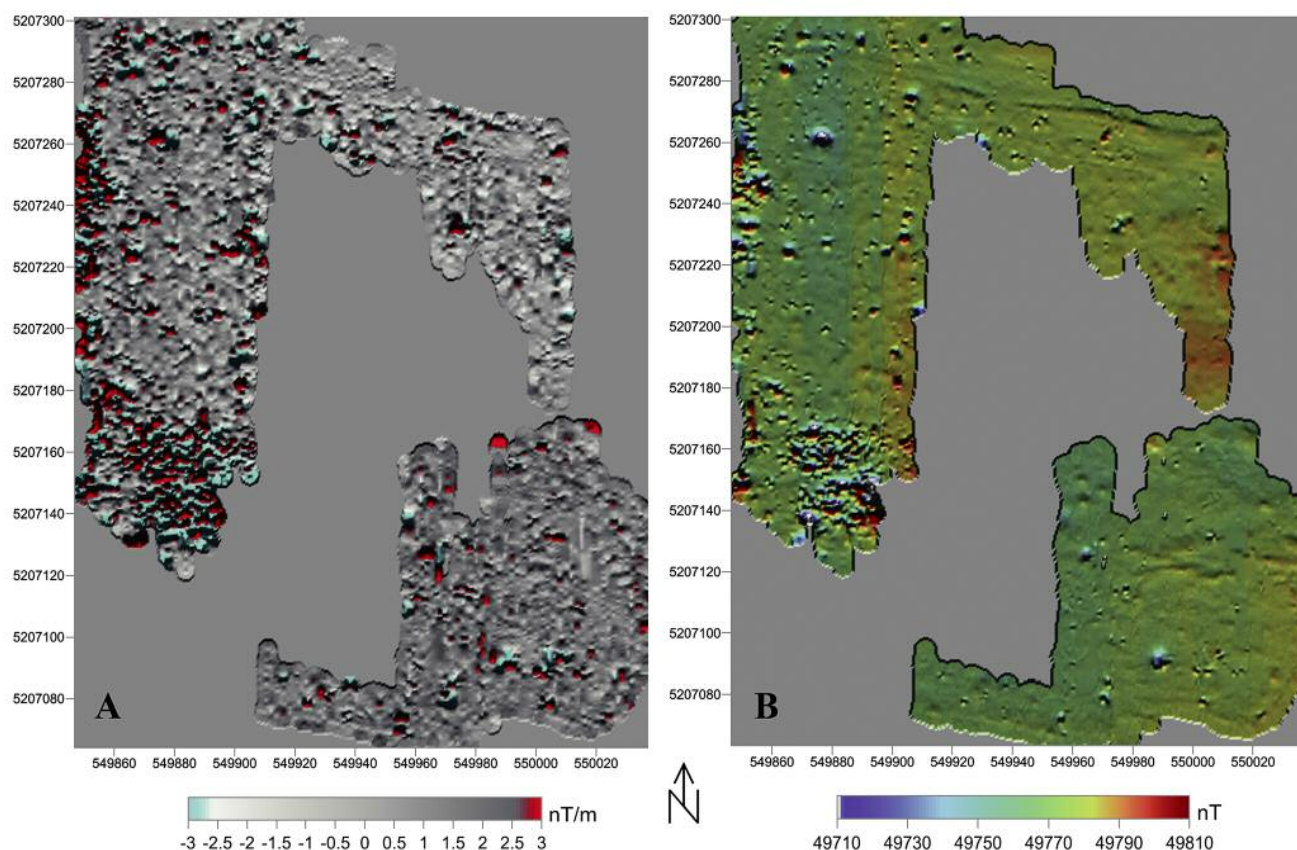


Fig. 4. Magnetic map of the site: A – map of values of the pseudo-gradient of the horizontal component of the total vector of magnetic field intensity within a range of  $-3$  to  $+3$  nT/m; B – map of values of the total vector of magnetic field intensity within a range of  $49710$  to  $49810$  nT (compiled by M. Bogacki, W. Małkowski).

Ryc. 4. Wizualizacja wyników prospekcji magnetycznej: A – mapa wartości pseudogradientu składowej poziomej wektora całkowitego natężenia pola magnetycznego w przedziale  $\pm 3$  nT/m; B – mapa wartości wektora całkowitego natężenia pola magnetycznego w przedziale  $49710$ – $49810$  nT (oprac. M. Bogacki, W. Małkowski).

anomalies IV, V, VI, and VIII are perpendicular to the remains of the rampart visible on the surface of the hillfort. Thus, their connection with the construction of the fortifications should be archaeologically verified.

Near the western rampart of the Konsulovskoe hillfort, another dipole-dipole anomaly (IX) 7 metres long was recorded (Fig. 5). By all probability it should not be connected with the structures of the rampart. Three point anomalies (X, XI, and XII) registered in the eastern part of the site might be a result of high temperature involved in operating such devices as ovens, kilns, or hearths (Fig. 5).

Within the area of the rampart of the citadel, two lines of anomalies were recorded. Presumably this could be linked with technical features of the fortifications with two lines of stone structures. The average distance between them, indicated on the map as A1–A2, was 7 metres (Fig. 5). Supposing that the boundaries of the citadel were defined by the inner line of the rampart, one can assume that its surface amounted to about  $2400$  m<sup>2</sup>. A break in the anomaly observed in the central part of the rampart of the citadel

can be supposedly interpreted as a gateway or other type of passage connecting two parts of the site.

Anomalies recorded in the northern part of the site (A3, A4, A5, and A6) were undoubtedly connected with the line of the fortifications, protecting the vicinity of the hillfort (Fig. 5). In the central part of the northern section of the fortifications along the distance of 45 metres a double line of anomalies (A4–A5) was recorded.

It should be noted that the remains of the defensive system of the hillfort observed on the map of the magnetic anomalies conform to the forms of surface relief visible in the field.

The resistivity survey was carried out with ADA-7 using electrodes in dipole-dipole configuration. Surveys were performed on five sectors (E1–E5) of the total area of  $1500$  m<sup>2</sup> (Fig. 6). The resistivity measurements were taken down to the depth of 1 metre, since the distance between measurement frames was 2 metres. The most evident results were recorded in the areas E1, E3, and E5. All these sectors were situated between or near the ramparts. The linear anomalies of high values of resistivity were recorded in all



Fig. 5. Interpretation of results of the magnetic measurements (compiled by M. Bogacki, W. Małkowski).

Ryc. 5. Mapa interpretacyjna rezultatów prospekcji magnetycznej (oprac. M. Bogacki, W. Małkowski).

the areas. They were probably caused by technical features of construction of the fortifications.

In the sector E1, situated in the north-eastern part of the citadel, three linear anomalies were recorded. However, archaeological verification carried out in Trench I, directly adjoining the sector E1, revealed only two linear

stone structures with stone debris between them. Most likely they were remains of a defensive wall (Fig. 7).

In the sector E3, two linear anomalies were recorded. Both were oriented along the N-S axis and placed maximally 7.5 metres from each other. Their presence confirms the results obtained from the magnetic prospection.



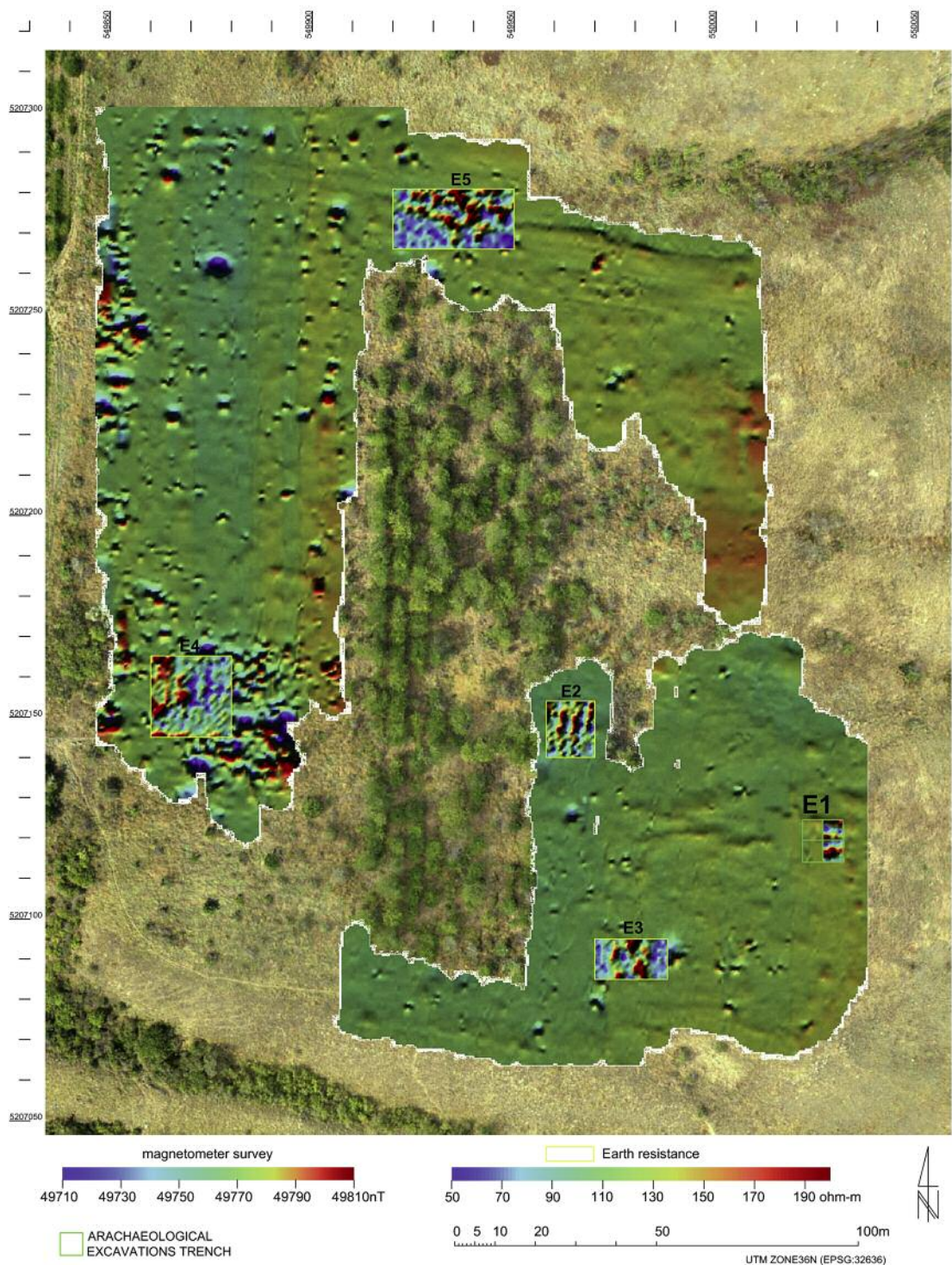


Fig. 6. Konsulovskoe hillfort. An orthophotomap with results of the magnetic survey and marked area of the resistivity survey (compiled by M. Bogacki, W. Małkowski).

Ryc. 6. Grodzisko Konsulowskoje. Ortofotomapa z nałożonymi wynikami prospekcji magnetycznej i zaznaczonymi obszarami pomiarów elektrooporowych (oprac. M. Bogacki, W. Małkowski).

In result of the electrical measurements carried out in the sector E5 two linear anomalies of high values of resistivity were recorded. The distribution of values on the map of the total vector of magnetic field intensity shows a clear break in anomalies. In this case, the resistivity method was complementary to the magnetic prospection, and

detected the presence of stone constructions related to the structures covered by the rampart.

Moreover, the two areas were surveyed with soil resistivity measurements. The sectors E2 and E4 were selected for obtaining extended knowledge about anomalies registered there during the previous magnetic prospection. The





Fig. 7. Konsulovskoe hillfort. The western section of Trench I and a cross-section through the northern rampart of the citadel (photo by D.D. Nykonenko).

Ryc. 7. Grodzisko Konsulowskoje. Profil zachodni wykopu I. Przekrój przez północny wał cytadeli (fot. D.D. Nykonenko).

area E2 was located in the central part of the hillfort, where three point anomalies (X, XI, and XII) were recorded during the magnetic survey. The resistivity measurements detected four linear anomalies oriented along the N-S axis. The question of their anthropogenic origin would require archaeological verification.

The map obtained as a result of the electrical measurements in the sector E4 located in the south-western part of the hillfort, where two large groups of magnetic anomalies (I and II) were recorded, shows low resistivity in the eastern and high resistivity in the western part. Electrical anomalies do not coincide with magnetic ones, which indicates their different sources. It cannot be excluded that the magnetic as well as the electrical anomalies registered in the sector E4 reflect modern human activities.

A general conclusion after the geophysical non-invasive survey carried out during the 2015 season on the Konsulovskoe hillfort suggests that in this case the magnetic and resistivity methods were complementary. The electrical resistivity measurements were more informative for understanding remains of the stone constructions below the ramparts due to the non-magnetic properties of the local

limestone. The magnetic prospection, in turn, proved valuable in case of searching and documenting buried features simultaneously with surveying of the entire part of the hillfort.

mgr Dymitr Nykonenko  
National Reserve 'Khortytsya'  
dnykon@gmail.com

dr Marcin Matera  
Institute of Archaeology, University of Warsaw  
marcinmatera@uw.edu.pl

dr Miron Bogacki  
Institute of Archaeology, University of Warsaw  
miron.bogacki@gmail.com

mgr Wiesław Małkowski  
Institute of Archaeology, University of Warsaw  
wmalkowski@uw.edu.pl

mgr Paweł Lech  
pawel.lech.1989@gmail.com

## Literature

ABER J.S.

*Picavet Suspension* (<http://www.geospectra.net/kite/equip/picavet.htm>).

GAVRILŪK N.A.

2013 *Èkonomika stepnoj Skifii VII–III vv. do n.è.*, Kiev.

GAVRILŮK N.A., KRAPIVINA V.V.

- 2005 *Nižnedneprovskie gorodiša k probleme vznikoveniâ i razvitiâ*, (in:) V.N. Zin'ko (ed.), *VI Bosporskie čteniâ. Bospor Kimmerijskij i varvarskij mir v period antičnosti i srednevekovâ. Periody destabilizacij, katastrof*, Kerč', 66–73.

GAVRILŮK N.A., SMEKALOVA T.N., ČUDIN A.V.

- 2009 *Magnitometričeskoe issledovanie pozdneskijskogo gorodiša u sela Červonnyj Maâk v užnoj časti tečeniâ Dnepra*, (in:) V.N. Zin'ko (ed.), *X Bosporskie čteniâ. Bospor Kimmerijskij i varvarskij mir v period antičnosti i srednevekovâ. Aktual'nye problemy*, Kerč', 90–94.

GOŠKEVIČ V.I.

- 1912 *Letopis' muzeâ za 1909, 1910 i 1911 g.g.*, Hersonskij Gorodskoj Muzej Drevnostej 2, Herson.

NIKONENKO D.D.

- 2015 *Pizn'oskijs'ke Konsulov'ske gorodiše*, "Arheologija" 2015/1, 91–99.

DMYTRO NYKONENKO, MARCIN MATERA, MIRON BOGACKI, WIESŁAW MAŁKOWSKI,  
PAWEŁ LECH

## GRODZISKO KONSUŁOWSKOJE, UKRAINA. BADANIA NIEINWAZYJNE W SEZONIE 2015

Należące do grupy tzw. grodzisk późnoscytyjskich/postscytyjskich stanowisko Konsułowskoje położone jest w pobliżu wsi Respublikaniec na prawym brzegu Dniepru. Badania archeologiczne grodziska rozpoczęte zostały w roku 2014 przez archeologów z Muzeum-Rezerwatu „Chortyca”. W 2015 roku odbył się pierwszy sezon wspólnych polsko-ukraińskich badań archeologicznych z udziałem archeologów z Uniwersytetu Warszawskiego. Prace obejmowały wykonanie pomiarów geodezyjnych, zdjęć latawcowych oraz prospekcji geofizycznej terytorium grodziska. Ponadto rozpoczęto weryfikację archeologiczną wyników uzyskanych przy pomocy metod nieinwazyjnych.

Na podstawie wykonanej dokumentacji fotograficznej i przeprowadzonych przy użyciu aparatury GPS RTK pomiarów geodezyjnych stworzona została ortofotomapa, model pokrycia powierzchni, a także trójwymiarowy model grodziska Konsułowskoje.

Na terenie stanowiska wykonana została również prospekcja geofizyczna – magnetyczna i elektrooporowa. Pomiar magnetyczny wykonany został przy użyciu magnetometru czecowego Geometrics G-858G i objął powierzchnię 2,5 hektara. Badania elektrooporowe pięciu obszarów o łącznej powierzchni blisko 1500 m<sup>2</sup> przeprowadzone zostały z wykorzystaniem aparatury ADA-7.